

APR 11 1925

Minnesota State Medical Association, Minneapolis, April 27-28-29, 1925

VOLUME VIII

NUMBER 4

# MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association  
Northern Minnesota Medical Association and Minneapolis Surgical Society*

## EDITOR

CARL B. DRAKE, M.D., St. Paul

## ASSISTANT EDITORS

F. W. SCHLUTZ, M.D., Minneapolis

DONALD K. BACON, M.D., St. Paul

## ASSOCIATE EDITORS

### First District

ORVILLE N. MELAND, M.D., Warren

### Second District

PAUL KENYON, M.D., Wadena

### Seventh District

H. B. AITKENS, M.D., Le Sueur Center

### Third District

E. L. TUOHY, M.D., Duluth

### Fourth District

F. L. ADAIR, M.D., Minneapolis

### Fifth District

GEO. B. WEISER, M.D., New Ulm

### Sixth District

F. M. MANSON, M.D., Worthington

### Eighth District

F. P. STRATHERN, M.D., St. Peter

APRIL, 1925

## CONTENTS

WILLARD L. BURNAP, M.D., Fergus Falls—The Silent Antrum.....	203
HERBERT Z. GIFFIN, M.D., Rochester—Splenectomy in Cases of Purpura Hemorrhagica....	207
CHESTER A. STEWART, M.D., Ph.D., Minneapolis—Thyroid Enlargement in Minneapolis Children .....	214
DONALD C. BALFOUR, M.D., Rochester—The Relative Merits of the Various Treatments of Peptic Ulcer .....	218
P. E. STANGL, M.D., St. Cloud—Acute Perforated Gastric and Duodenal Ulcer.....	224
FREDRICK A. WILLIUS, M.D., Rochester—The Progress of Cardiology During 1924: A Re- view of the Works of Clinicians and Investigators in the United States.....	230
J. A. MYERS, Ph.D., M.D., and W. P. SHEPARD, M.D., A.M., Minneapolis—Tuberculosis and Other Respiratory Infections Among University Students.....	237
CHARLES R. BALL, M.D., St. Paul—Some Observations Concerning Tic Douloureux After Sixteen Years' Experience .....	242

(Continued on Advertising Page III)

Owned and Published Monthly by

## THE MINNESOTA STATE MEDICAL ASSOCIATION

### BUSINESS MANAGER

J. R. BRUCE, 402 Guardian Life Bldg., Saint Paul

Telephone: Cedar 1683

201 Commercial Bldg., Minneapolis

Telephone: Atlantic 2716

Entered at the Post Office in Saint Paul as second class mail matter.

Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized  
July 13, 1918.

Subscription Price { \$3.00 yearly, Domestic  
                                  \$3.50 yearly, Foreign

[CONTENTS OF THIS PUBLICATION PROTECTED BY COPYRIGHT]



# Live Food For Babies

*There is none so good*

*First thought—*

**BREAST MILK**

*Second thought—*

**FRESH COW'S MILK  
WATER *and*  
MEAD'S DEXTRI-MALTOSE**

*For Your Convenience*  
Pamphlet on Breast Milk  
Pamphlet on Dextri-Maltose

## *The Mead Johnson Policy*

Mead's Infant Diet Materials are advertised only to physicians. No feeding directions accompany trade packages. Information in regard to feeding is supplied to the mother by written instructions from her doctor, who changes the feedings from time to time to meet the nutritional requirements of the growing infant. Literature furnished only to physicians.



**MEAD JOHNSON & COMPANY**  
Evansville, Ind., U. S. A.

# MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association  
Northern Minnesota Medical Association and Minneapolis Surgical Society*

VOL. VIII

APRIL, 1925

No. 4

## THE SILENT ANTRUM\*

WILLARD L. BURNAP, M.D.

*Fergus Falls, Minnesota*

The hunt today for infective foci is relentless. Some, over-zealous, make pot-shots which sacrifice the innocent; still, the addition of fifteen years to man's life expectancy is sufficient triumph to excuse an occasional reckless hunter.

Enthusiastic as we are in this hunt, it is safe to say, the keenest occasionally pass dangerous prey unnoticed. My observations have convinced me that one of the safest hiding places for germs is the maxillary antrum. Here they are passed by the mightiest hunters.

That germs, once safely lodged in the antrum, are so frequently undisturbed, is largely due to the fact that our education has led to the belief that empyema of the antrum maxillare must produce certain classical symptoms such as nasal obstruction with manifest difficulty in breathing, unilateral nasal discharge, and pain in and around the antrum.

This paper makes no pretense of scientific excellence. It aims, simply by presenting a few illustrative cases, to call to your attention how far astray one may be led if too much dependence be placed on subjective manifestations, as a large percentage of those affected with an infected antrum are unconscious of any head trouble.

That the subjective manifestations of a chronic antrum may be nil, and be overlooked by men of ability, is illustrated by the following cases:

Olga J— had been in the hands of two very capable diagnosticians, because of joint disturbances suggesting focal infections. All foci were thought to have been eliminated.

She came to me troubled with blurring of vision and pain in the right eye when doing close work.

Refraction showed one diopter of hypermetropia with astigmatism. This was corrected, with complete relief of

the blurring, but occasional pains through the right eye continued.

There was no nasal manifestation, the air spaces being adequate in both nostrils, the turbinates normal in size, and the mucous membranes healthy. She was sure she had no head trouble, though eight years previously she had been treated for acute frontal sinusitis. This had readily cleared up under local treatment.

Transillumination showed a very dark right antrum, confirmed by the roentgen ray. Trocar washing gave a large amount of thick yellow pus.

Another case is that of Doctor B—:

Doctor B— complained of soreness and pain in his right elbow, also a numbness and tingling on the left side of his tongue. When told that his left antrum was absolutely dark and there was probably pus there, he refused to accept the diagnosis, because he never had any trouble with his nose. As a matter of fact, the air spaces were adequate, membranes healthy, and there was no sign of discharge. He was only convinced by a Rochester confirmation.

That antrum infection is common, but often undiagnosed, is shown by post-mortem findings of J. P. Tunis, of Philadelphia. Thirty-seven out of one hundred heads examined showed some evidence of pathological change. Of the thirty-seven, eleven were examples of edema, twelve of chronic inflammation or empyema; though in none of the cases was death due to diseases with which empyema of the antrum is especially associated. For example:

Tuberculosis caused the death of twenty-one, with only one showing antral tuberculosis. The most significant feature is the fact that only one of the cases was diagnosed during life.

Even though the figures given by Tunis are high, and throughout the country the incidence of antrum involvement is considerably less, it would still be frequently present in every practice. When a large general practice does not bring to light a number of antrum infections each year, the conclusion must be that they have been overlooked. To discover these antri is chiefly the work of the general practitioner, because, as stated before, the head disturbance is not usually sufficient to drive the sufferer to a specialist.

In searching for possible infection in the nasal

\*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, October 10, 1924.

accessory sinuses, one must consider the antrum of Highmore, the frontal, anterior, middle, and posterior ethmoidal and sphenoidal sinuses. These have been grouped clinically, for convenience, into two series:

1. Maxillary, anterior ethmoidal, and frontal, emptying into the middle meatus; that is, below the middle turbinate.

2. Posterior ethmoidal and sphenoidal sinuses, draining into the superior meatus; that is, above the middle turbinate.

All the accessory sinuses have drainage openings. In some, as in the frontal, it is direct; that is, the ostium is in the floor. The ostium of the maxillary sinus is high above the most dependent portion, so drainage depends upon the cilia of the epithelial lining. This location of the ostium, and its relative small calibre, are important factors in the inflammatory processes which involve the lining mucous membranes. The lack of adequate drainage and ventilation increases the number of infections and hinders recovery.

Some authorities attach no importance to these anatomical peculiarities, insisting that one hundred per cent of all antral infections are due to devitalized teeth (Tubey). As the antrum is at times involved in the absence of diseased teeth, and as infections which frequently occur in the other accessory sinuses cannot be ascribed to the teeth, this position seems untenable. The teeth, nevertheless, must be given first consideration in etiology. Frequently recurring colds may be acute exacerbations of a chronic antrum infection with a tooth origin. The case of Alfred L— is quite typical:

This patient had doctored a number of years for colds in the head. These attacks began with severe sneezing. In the course of twenty-four hours, the left nostril became completely occluded, and finally the right. A very severe unilateral headache then developed. If the membranes were kept contracted by frequent applications of adrenalin, the headache was soon relieved, and the attack terminated.

Examination showed pus in the left antrum. The removal of a dead premolar, with doubtful roentgen ray findings, gave early and permanent relief.

Interpretation of dental films, as to the relation of the antrum to the tooth roots, requires much skill and experience. If the root tip comes into immediate contact with the antral wall, there will be no area of bone softening and absorption. For this reason, many vicious teeth escape detection.

Antral infection may be a part of a similar in-

fection of the nasal mucosa. These usually terminate in resolution provided there is adequate drainage and ventilation; if not, ulceration may occur and the process extend to the bone, inducing caries, or terminate in the chronic form of disease, the mucosa gradually thickening and proliferation of connective tissue taking place. If the periosteal layer is involved, polypoid masses or osteomata may develop.

Chronic antral infections may be discovered accidentally during a secondary infection, as in the following case:

Mrs. S., a doctor's wife, was brought to the hospital on account of an alarming attack of acute laryngitis, bordering on edema. Strangulation was feared. The usual remedies were applied. In a few days, the distressing symptoms subsided, to be followed by a very severe unilateral headache. Some swelling developed over the left cheek, the nose became obstructed, and the breath foul. There was no nasal discharge.

The left antrum was extremely dark to transillumination, and, on being washed out, showed a very foul pus.

This patient gave a history of previous attacks of laryngitis associated with headache. For two years she had been very nervous, sensitive to noises, and irritable; all of which is foreign to her nature. She also occasionally had neuralgic headaches, which were better in the morning and made worse by stooping. In spite of these suggestive symptoms presented daily to a capable physician, the antral infection was not suspected.

An important point in examining the nasal fossae is the thorough contraction of the membranes by the use of adrenalin cocaine spray, or application. If this is made a rule, many mistakes will be avoided. After the membranes are blanched, careful search should be made for pus issuing from a fossa. If none is evident, negative pressure should be induced by the use of the suction bulb. If pus then presents in the middle fossa, it remains only to determine from which of the three sinuses in the first series it comes. Transillumination, roentgen-ray, and puncture are the chief tools used in the differentiation. Transillumination should not be omitted, even if no pus presents, as frequently its character is such that it cannot, or does not, pass through the ostium.

Pain is a very misleading symptom. It is usually present in acute cases, often unilateral and severe. In the chronic, it is most often absent, as illustrated by the following case:

Miss N— for three years had been annoyed by a foul smelling nasal discharge. Nasal douches of various descriptions had been prescribed by several physicians. She ex-



perienced no discomfort, aside from the annoying discharge. Permanent drainage of an infected antrum gave complete relief.

Pain usually indicates retention due to partial or complete closure of the ostium. This may be caused by thickening of the membranes, polypoid growths, or heavy secretions. Pain, when present, is usually through the cheek or around the eye. It may, however, be removed and suggest some other lesion, as in the patient here reported:

Mrs. K— had been annoyed for years with droppings in her throat at night. There was no disturbance during the day, except an occasional bad breath. There was no nasal obstruction, pain or tenderness over the antrum. For some years she had periodic pain in the right ear and mastoid. This pain was much exaggerated when she had a cold in the head and in chilly weather.

On examination, the ear and mastoid were negative, but the right antrum was filled with pus. Drainage completely and permanently relieved the pain in the right ear.

Tenderness, elicited by pressure over the canine fossa, is only present in the same type of cases as give localized pain over the antrum. This tenderness may extend to all the upper teeth on the affected side, making mastication very difficult.

Transillumination should always be used, but carefully interpreted. This simple procedure, if routinely applied, would save many an error. A dark room is necessary, and a good rheostat indispensable, as it is only by observing under various degrees of light intensity that accurate findings can be made. Frequently only very weak light will give the contrasts. The test is purely comparative, but quite reliable, as the normal antri seldom vary in size or density of walls. A dark antrum may be due to an old healed process, or very rarely, to anatomical peculiarities. In the absence of other nasal findings, two antri illuminating easily and equally justify the conclusion that they are normal.

In cases where transillumination reveals differences in antral density, roentgenograms should be taken. Such pictures are very valuable, not alone in confirming other findings, revealing differences in densities and abnormalities, outlining the size and shape of the sinuses, and the position of the floor, but also, if skillfully taken and interpreted, by greatly assisting in determining complicating frontal, ethmoidal, and sphenoidal involvement.

Trocar puncture through the nasal wall of the antrum and under the middle turbinate at its at-

tachment, usually gives incontrovertible evidence; so it is the final proof and court of last appeal. These punctures, when good anesthesia is secured, are not very painful, but are never pleasant, and are properly reserved to the last.

Through the trocar, the contents of the antrum can be washed out the natural opening. If the water returns clear, it is good evidence that there is no pus present; provided the trocar actually entered the antrum, and the secretions are not too tenacious. The following case illustrates this point:

Miss D— had for the past year been greatly distressed by joint pains and tenderness. Dead teeth and diseased tonsils had been removed without the hoped-for relief.

Re-examination revealed a very dark right antrum, with other sinuses negative. Trocar washings were negative for several washings (at the one sitting). However, after agitating the fluid in the antrum and having her tip her head to the left, a heavy tenacious pus was washed out.

*Treatment.*—One of my most lasting impressions from a great clinic, held some twenty years ago, is of a woman who was exhibited to our admiring gaze from time to time over a period of months. Her disease, a suppurating antrum, was considered rare. She had rubber tubing extending from the alveolar process, through the antrum, out the nostril. It was demonstrated how nicely an irrigator could be connected, through-and-through drainage secured, and thus a rapid cure accomplished. When I graduated this rapid cure was progressing favorably. Antrum therapy has made great strides since then, but some are still anchored to the past.

Remove all dead teeth which are at all suspicious. If this is not done, cases will be relieved, only to return again.

Acute cases should be treated several times daily, by use of a solution of cocaine and adrenalin in water or alypin. There is a marked tendency to tumefaction of the nasal mucosa, which stops drainage and halts progress. This remedy may be applied as a spray, but best results are secured by direct application to the ostium maxillare. When blanching is thoroughly accomplished, suction should be used, either by syringe or suction irrigation. The suction irrigation is very useful in all sinus infections.

If there is not prompt relief, irrigation through a puncture needle should be instituted. After thorough irrigation with salt solution, a solution of 20 per cent argyrol can be left in the cavity. Barring

complications, acute cases should rapidly cease after a few punctures.

Irrigation is not pleasant, and is time-consuming; therefore, unless relief is manifest and prompt, the intra-nasal operation should be resorted to. This gives early relief, is easily done, and occasions no subsequent scabbing or annoyance. Radical and mutilating operations are rarely or never necessary.

*Conclusions.*—1. Acute and chronic infections of the maxillary antrum are common in every-day practice.

2. A very small percentage of antral infections are diagnosed early; most remain for years, and many are carried to the grave.

3. Part or all classical symptoms may be absent. Therefore, most antral infections will be found only by hunting for them.

4. Good treatment is based upon drainage and ventilation. When this is provided, the mucosa rapidly returns to normal in acute cases, and ultimately in most chronic cases.

5. When permanent intra-nasal drainage is established, few or no subsequent treatments are necessary.

6. Radical and mutilating operations are never necessary in acute infections and are rarely necessary in the chronic infections.

#### DISCUSSION

DR. HORACE NEWHART (Minneapolis): Dr. Burnap in his very excellent paper has done a distinctive service to the profession in pointing out to us the importance and relatively frequent occurrence of latent maxillary sinus disease. The discovery of the possibilities of latent maxillary disease has revealed a new and heretofore overlooked causal factor existing in many general manifestations of a focal infection, as for instance nephritis, multiple neuritis, arthritis, cardiac disease, etc.

I believe no one is more familiar, however, with the difficulties of diagnosis in this field and with the possibility of overlooking the latent maxillary sinus than the rhinologist. The classical methods of diagnosis as far as we have employed them are by no means in all cases absolute and final.

Take for instance transillumination. After reading our text-books it would seem easy by transillumination to recognize at once a pus-filled or diseased maxillary sinus. But in actual practice we find a very considerable number of cases which transilluminate unsatisfactorily because of the effects of previous attacks of inflammation with consequent thickening. This difficulty is especially apparent in those cases in which both sides are involved when there is no normal translucency for comparison.

The x-ray which we formerly regarded as almost infallible in sinus work, we find after a larger experience to be capable of leading us into error of diagnosis. As an adjunct in diagnosis it is invaluable, but must be checked by our clinical findings. To illustrate, only a few months ago one of our prominent physicians brought in his wife with a positive diagnosis of double maxillary empyema, both sides being very definitely involved, according to the very excellent plates which accompanied the patient. There was an abundant purulent discharge from both nares. Puncture and washing revealed absolutely no pus. The apparent involvement as shown on the x-ray plates was due to changes in the density of the walls from former attacks. The correction of a deviated nasal septum promptly cured the patient of all symptoms. Once in our experience, guided by the x-ray and the patient's complaint of persistent pain, we did an exploratory operation of the sinus through the anterior maxillary wall, only to find the antrum entirely normal.

As regards the matter of puncture, it should be noted that even here at times we may be absolutely at a loss, or the findings may be negative. This is especially apt to be the case when there is a congenital absence of a natural ostium which occurs in quite a percentage of cases, or the natural ostium may be occluded by the swollen lining membrane, or by the presence of polypi acting like a ball valve, or there may be occlusion caused by the presence of inspissated pus. Therefore I would warn against making an absolutely positive diagnosis by any one of the usual methods.

We have personally come to look with suspicion upon every case presenting a chronic nasal discharge with or without pain, but with remote symptoms when there is a high deflection of the nasal septum; for here we have a condition which, because of poor ventilation and drainage invites repeated attacks of rhinitis. In such cases where there is any suspicion we urge at once making the diagnostic puncture and washing.

Unfortunately I am obliged to sound a rather pessimistic note in connection with one of the conclusions of the essayist, and that is in regard to the ease with which these cases clear up as a result of endonasal operation. We have found it vastly more satisfactory in many of these chronic cases to do the radical operation of Caldwell-Luc for the reason that from the very start we have all the advantages of an exploratory operation, revealing absolutely the contents and condition of the cavity itself. This operation is not mutilating or severe or deforming. It presents no disadvantages over the endonasal method with every advantage in its favor.

I wish once more to congratulate the author on putting this subject on the program of our State Society. Heretofore it has been discussed largely in societies of specialists, but after all it is the man on the firing line, the general practitioner or the pediatrician, who sees these cases first. He should be on his guard and should suggest the possibility that the symptoms for which the patient consults the physician may originate in a latent maxillary sinusitis.

DR. J. T. SCHLESSELMAN (Mankato): There is very little that anybody can add to the fine paper of Dr. Burnap's and

the discussion by Dr. Newhart, but I wish to call attention to one point in diagnosis and that is the use of the stereo x-ray in sinus examinations and in all head pictures. I had a case come to my attention a week ago of which I have a stereo-picture. It is impossible to throw a stereo-picture on the screen, so anyone wishing to see it can see it in the lobby of the Breen Hotel. A stereo-picture gives a much better view of the intracranial and head conditions. Anyone taking a look at it can see how it would show the details of conditions in the sinuses and especially in the deeper sinuses like the ethmoids and the sphenoids.

There is one other thing that I would like to mention and that is the idea some have that the washing out of the antrum is a very harmless procedure. Literature shows that not infrequently a patient goes into collapse or shock while washing out the antrum. The reason for that probably is that the ostium is closed up by secretions or polypoid masses and pressure is being used. But I think that if care is taken after the trocar is entered and air put through, little danger will be encountered.

DR. W. E. CAMP (Minneapolis): I would like to say a few words commending Dr. Burnap on his splendid paper and the discussion which has followed. We have been fortunate in seeing, in the last two or three years, quite a large number of cases of both acute and chronic maxillary sinusitis; in many of these, particularly the chronic ones which have been operated by the radical operation, we have examined the tissues microscopically. They all show considerable round cell infiltration with cystic and mucoid degeneration of the mucous membrane and the formation of polypi, typical mucoid polypi, which are frequently found in the nose in cases of chronic maxillary sinusitis. As to the dental origin of chronic maxillary sinusitis it has been our experience that most of them are not of dental origin. Although two or three of them have shown pathology in the mucous membrane near the roots of the teeth or on the floor of the antrum, most of them showed involvement of the entire mucous membrane.

We had two very interesting pathological examinations from these cases. One of them was a chronic cystic inflammation, resembling cystic disease which occurs in the endometrium of the uterus. In fact, examining this specimen microscopically it would be almost impossible to differentiate it from a chronic cystic endometritis. The other case was an elderly woman who had trouble with her antrum for several years, accompanied by pain. Examination of the nose presented a mass in the middle meatus. We thought at once of malignancy, owing to her age and pain, but upon exploring the antrum by a radical operation it was found to be completely filled with a friable necrotic mass, which upon microscopic examination proved to be a chronic necrotizing empyema. These two cases were very instructive to us, showing the marked change which might occur in a chronic empyema of the maxillary sinus.

In closing I would like to say a few words stressing what Dr. Newhart has said in regard to the external operation. In our experience it has been much better to go in through the canine fossa, which enables one to get a good look down into the maxillary sinus and to make a counter opening into the inferior meatus.

## SPLENECTOMY IN CASES OF PURPURA HEMORRHAGICA\*

HERBERT Z. GIFFIN, M.D.

Division of Medicine, Mayo Clinic  
Rochester, Minnesota

The demonstration of marvelous improvement and probable cure following splenectomy for thrombocytopenic purpura hemorrhagica, which has been a feature of the literature since 1916, is the most interesting and the most important contribution to the treatment of diseases of the blood since the adoption of splenectomy for hemolytic jaundice; it also suggests new possibilities in the physiology of coagulation, in the study of the function of the spleen and the effect of splenic function and dysfunction on the capillaries, the bone marrow, and on coagulation of the blood. Thrombocytopenic purpura hemorrhagica may be acute, from several days to a few weeks in its course; subacute, with a duration of months or a year or two; or it may be chronic, lasting from ten to twenty years. Acute cases are very rare. The chronic types frequently date from childhood and are remittent in character. The disease usually begins with petechiae on various portions of the body, to be followed in weeks or months by epistaxis, bleeding from the gums, and, in women, menorrhagia and metrorrhagia; occasionally there may be bleeding from the gastro-intestinal tract and from the urinary system, and later cerebral hemorrhage not infrequently occurs. The spleen may or may not be palpable; it can usually be felt, however, and is occasionally considerably enlarged. The mildest cases may recover spontaneously after the removal of foci of infection or following transfusions. In the resistant cases, whether mild or severe, horse serum, thromboplastic material, radiotherapy, calcium chlorid intravenously, ergot, local styptics, and mechanical packing, are only of temporary benefit. Transfusions at short intervals, every few days, are essential at times to maintain the blood and general condition, and may carry the patient through to a remission. The uncontrollable bleeding may be terrifying to the patient, the family, and the physician; the victim is often a young, otherwise robust, individual.

The most important features of the blood in the

\*Read before the Minnesota State Medical Association, October 9, 1924, St. Cloud.

differential diagnosis of purpura hemorrhagica are: (1) a low platelet count, usually between 20,000 and 80,000, (2) a long bleeding time, after a clean puncture wound, (3) a normal coagulation time when blood is carefully taken directly from the vein and allowed to coagulate in a tube, (4) an absence of the normal retractility of the clot, and (5) a positive tourniquet test, the appearance of petechiae on the application of a tourniquet to the arm for three minutes at a pressure midway between the systolic and diastolic readings. In cases of hemophilia, by contrast, the most important findings are: (1) a prolonged coagulation time when the blood is drawn directly from a vein, (2) a normal or somewhat prolonged bleeding time, (3) a normal number of platelets, and (4) a positive history of heredity, frequently with the presence of joint changes and hematomas. Acute aplastic anemia in its later phases may be difficult to distinguish from purpura hemorrhagica. Aplastic anemia shows an extreme degree of leukopenia, with a correspondingly low platelet count, and the appearance of hemorrhagic manifestations usually later than the anemia. Acute aplastic anemia may simulate hemorrhagic purpura so closely that definite differentiation is impossible. The persistent leukopenia in acute aplastic anemia is of especial importance as a diagnostic feature, and a great deal of stress may be placed on this finding when all other findings are identical with those of hemorrhagic purpura.

Besides hemophilia and acute aplastic anemia, other diseases may offer difficulties of diagnosis, especially acute leukemia in which the leukocyte count is normal or leukopenia is present. Here a careful study of the smears for immature cells is essential. There is, moreover, an occasional type of hemorrhagic disease which cannot be classified satisfactorily, either because of a normal platelet count associated with other features suggestive of hemorrhagic purpura, or the occurrence of a family history indicative of hemophilia associated with clinical manifestations of purpura and coagulation factors of a mixed type.

Port and Aiyama splenectomized normal rabbits and demonstrated an increase in the platelet count in all instances. An increase in the platelet count has been noted following splenectomy for various syndromes in man. It had also previously been recognized that the hemorrhagic tendency became temporarily less marked following splenectomy in

certain cases of pernicious anemia and leukemia. This association of spleen with the platelet count, and the hemorrhagic tendency, led Kaznelson, in 1916, to suggest splenectomy for thrombocytopenic purpura hemorrhagica. His patient had had recurrent attacks of severe purpura hemorrhagica for ten years. During the five years following splenectomy up to the time of a subsequent report in 1921,<sup>9</sup> there had been no recurrence of purpura or hemorrhage. The patient may be regarded as cured. Brill and Rosenthal were the first to direct attention to the subject in this country. The first patient in the Clinic was mentioned in a discussion of the paper by Brill and Rosenthal and again in an article by Giffin and Holloway. The patient had a very severe type of the disease; she is apparently well twenty months after splenectomy. The publication of other cases is justifiable in order to arrive at as clear a conception as possible of the type of purpura which may be submitted to splenectomy, of the surgical risk involved, and of the probable postoperative course. In this paper the first four cases of splenectomy will be reviewed. Cases 1 and 2 were mentioned in an article by W. J. Mayo. In a forthcoming number of the Medical Clinics of North America four additional cases will be reported.

#### REPORT OF CASES

*Case 1.*—A woman, aged thirty-one years, came under observation December 20, 1922. She was in very poor general condition and moderately anemic. A history of hemorrhagic disease in the family was not obtained. She had had a tonsillectomy in 1916 without excessive bleeding; in 1917, she had had a slight illness suggestive of cholecystitis. In October, 1921, petechiae and purpuric areas were noticed about the hips and thighs. A month previously she had given birth to a normal child without untoward incident. In December, 1921, a tooth was extracted, with excessive bleeding for three days. During the following nine months petechiae and purpura appeared and reappeared on the legs and thighs; at times the condition was quite severe. In September, 1922, the patient had contracted severe rhinitis. About October 1, slight bleeding occurred; a week later the bleeding was severe, necessitating packing. This continued to recur, and the patient was given two small transfusions. November 3, she began to flow for the first time since the preceding pregnancy and bled profusely for seven days. She became very anemic and a series of transfusions was necessary. During this period bleeding from the nose and gums occurred intermittently. December 6, severe uterine bleeding recurred and continued for ten days; uterine packing was necessary. There had been no bleeding from the gastro-intestinal or urinary tract.

The patient's hemoglobin was 55 per cent, and the erythrocytes numbered 3,260,000. A differential count showed



nothing of importance. Petechiae were present over various parts of the body, including the mouth, and there was intermittent bleeding from the nose and gums. Platelet counts were quite consistently under 100,000, not infrequently below 75,000, several times below 50,000 and once 24,000. Coagulation time by the Lee method was normal; bleeding time was prolonged and was associated with soft clot. The prothrombin time was constantly prolonged, and the tourniquet test was very definitely positive. The spleen was palpable. A Wassermann test was negative, and it was impossible to demonstrate any clinical evidence of syphilis. Blood cultures were negative; a search for foci revealed only one periapical abscess. The gallbladder and the uterus and adnexa were somewhat under suspicion because of the previous history.

Radium exposures over the spleen and calcium chlorid intravenously resulted in only a temporary effect on the coagulation, and 500 mg. hours of the intra-uterine application of radium was without effect. In January, 1923, excessive menstruation recurred, and transfusions were begun. Courses of coagulen and thromboplastin were given without definite effect on the coagulation time or platelet count. For a period of forty days twelve transfusions were necessary to maintain the patient's condition. However, January 26, an infected tooth was extracted without prolonged bleeding. January 30, menstruation again began, and the uterine bleeding was of varying degrees of severity for thirty days, necessitating uterine packs and repeated transfusions. During this period the erythrocytes dropped to 1,610,000 and the hemoglobin to 18 per cent; the color index was less than 1, and the leukocytes varied from 4,000 to 7,000. By March 5, the erythrocytes had risen to 3,310,000, and the hemoglobin to 56 per cent, but the patient was very much exhausted as a result of her long continued illness.

Splenectomy was done March 7, 1923 (C. H. Mayo), and was followed immediately by transfusion. The spleen was somewhat enlarged and very adherent. In spite, however, of the difficulty of the operation, there was no excessive bleeding after the spleen had been removed. Sutures were necessary along the edge of the stomach and the tail of the pancreas. The gallbladder appeared to be normal, and the liver was somewhat congested. The spleen weighed 210 gm. The number of platelets in the blood from the splenic vein was 48,000, but the accuracy of the count cannot be estimated. The extract from splenic puncture showed large numbers of platelets.

Six hours after splenectomy the patient's platelet count was 202,000, whereas before operation it had ranged from 40,000 to 80,000, and the bleeding time was normal. Platelet counts made every second day varied from 175,000 to 227,000. Sixteen days after operation the count was 365,000; coagulation time by the Boggs method six minutes; the bleeding time, which had always been prolonged before operation, two and one-half minutes, and the prothrombin time, which had likewise been constantly prolonged before operation, normal. Slight uterine oozing occurred on the third and fourth days but not afterward. There had been no evidence of bleeding from the nose and gums, and the petechiae had all disappeared. Six weeks after operation there had been no recurrence of bleeding; the hemo-

globin was 68 per cent, and the erythrocytes numbered 4,000,000.

Twenty months after operation the patient was in good general health. There had been no recurrence of bleeding or petechiae. There may have been a slight persistence of anemia. On the other hand, the patient has never been robust, but is nevertheless able to care for her household, including two children. A recent blood count has not been obtained.

*Comment.*—This case is an example of a very severe form of the disease; at least twice during its observation death would not have been unexpected. Recuperation, however, occurred on transfusion, and it was later possible to proceed with splenectomy even though the patient was in very poor general condition, and was exhausted as a result of long continued, severe illness. It is a common experience to lose patients in cases of this type, and previous to the adoption of splenectomy in the Clinic, two or three patients with severe hemorrhagic purpura died each year.

While the patient in Case 1 is not naturally robust, she has, nevertheless, been entirely free from bleeding since operation, now twenty months, and is able to do her housework.

*Case 2.*—A girl, aged twenty-three years, was admitted to the Clinic June 12, 1923, on account of excessive menstruation. She had no knowledge of bleeders in the family. She had evidently had purpuric spots on slight injury from the age of ten. Menstruation began at fifteen and was quite regular every twenty-six days, although definitely excessive until the summer of 1918 when she menstruated every two weeks for six or seven days, losing a large amount of blood and passing clots. She was in bed for five months in 1918 on account of anemia and loss of blood. For the last two years menstruation occurred every twenty-six days, but was excessively profuse. Since puberty there had been frequent petechiae and purpuric areas, and scratches and cuts had bled freely; nosebleeds had been frequent and severe from the age of fifteen to nineteen.

The patient was pale. The hemoglobin was 54 per cent; erythrocytes numbered 3,370,000, and leukocytes 7,200. The differential count showed lymphocytes 20.0, large mononuclears 3.0, transitionals 3.0, neutrophils 72.0, eosinophils 0.5, basophils 1.5, anisocytosis slight, poikilocytosis slight, platelets 116,000; coagulation time (Boggs) five minutes, coagulation time (Lee) six minutes, bleeding time twenty-two minutes, prothrombin time normal. The spleen was palpable. June 25, the platelets were 100,000, and bleeding time one hour; clot retraction was fairly satisfactory at the end of six hours; the tourniquet test was positive. Subsequent platelet counts were 54,000, 56,000, and 64,000. June 20, a transfusion of 300 c.c. of blood by direct method was given without reaction. July 31, a tooth was resected for periapical infection; a considerable amount of oozing continued for a week. During August the platelet count was persistently low, varying from 28,000 to 76,000. September 1, infected tonsils were removed; there was very little



bleeding for several days, when rather free continuous oozing occurred. Transfusions were given again September 13 and 18, 500 c.c. each, by the citrate method. September 20, the platelets were 136,000, the hemoglobin 56 per cent, the erythrocytes numbered 3,320,000, leukocytes 8,800, coagulation time (Boggs) five minutes, and bleeding time eighteen minutes.

The patient went home for several weeks and returned October 27. She had been feeling a little better since tonsillectomy, but profuse menstruation continued without intermenstrual bleeding. Petechiae and purpura were present and the spleen was palpable. The hemoglobin was 55 per cent, erythrocytes numbered 4,430,000, leukocytes 8,800, platelets 62,000, coagulation time (Boggs) five and one-half minutes, and bleeding time six and one-half minutes.

Splenectomy was performed October 29 (W. J. Mayo). There was considerable oozing from the smaller vessels but no more hemorrhage than ordinarily occurs from the larger vessels. The spleen was three times normal in size and weighed 200 gm. A post-operative transfusion was given.

Five hours after operation the platelet count was 86,000, and the next day 146,000. On the sixth day it was 638,000, after which a gradual reduction occurred. The bleeding time fell promptly to two and one-half minutes and the coagulation time was normal. Convalescence was uneventful; all bleeding ceased. November 14, sixteen days after splenectomy, the hemoglobin was 58 per cent; erythrocytes numbered 4,990,000, and leukocytes 12,700. The differential count showed nothing of importance; the platelet count was 214,000, and the bleeding time four minutes.

May 7, 1924, five and one-half months after operation, the blood count was normal, aside from a leukocyte count of 10,100. The platelets were 150,000; the bleeding time was one and one-half minutes. November 1, one year after operation, the patient was apparently in good health, and had been working steadily for about six months. During the early part of November she was vaccinated. Six days later she became ill with fever, chills, and a very sore arm, without, however, apparent secondary infection. This illness lasted for about three days. The day following onset a few petechiae on the forearms and around the neck, and a small purpuric area on the leg, were noticed. These disappeared promptly and did not recur. There had been no excessive menstruation. January 1, 1925, fourteen months after operation, the patient was well.

**Comment.**—The occurrence of a small crop of petechiae one year following splenectomy after a chill and fever accompanying vaccination is the only instance of this association either in this series of cases or in those reported in the literature. In one of the series, and in two cases from the literature, there was a slight recurrence following a severe cold, only to subside promptly. It may possibly indicate a specific type of infection which is sufficiently severe during acute exacerbations to cause a recurrence of the purpura in spite of improvement caused by splenectomy. The pathologic appearance of the splenic tissue in purpura hemorrhagica is indicative of an acute spleni-

tis, and would be in keeping with this suggestion of an infectious origin, as would also the improvement in mild cases, which is so frequently seen in children following tonsillectomy.

**Case 3.**—A man, aged twenty-four years, was first seen January 9, 1920. His family history was negative for evidence of hemorrhagic disease. Since the age of twelve he had had severe nosebleeds several times a year. There had been slight oozing from the gums almost continuously, and the gums bled with the slightest trauma; petechiae appeared frequently. Two months before examination, he had had a very severe nosebleed resulting in marked anemia. The hemoglobin was 43 per cent; erythrocytes numbered 3,770,000, and leukocytes 5,000; the differential count showed 68 per cent neutrophils, 23 per cent small lymphocytes, 6 per cent large lymphocytes, 2 per cent eosinophils, and 1 per cent basophils. The platelet count was 88,000; the coagulation time by the Boggs method was five minutes, and by the Lee method five and one-half minutes. The bleeding time was forty minutes, and the prothrombin time was slightly prolonged. The patient was very weak and ill. A systolic murmur was present at the base of the heart, and the pulse was somewhat suggestive of the Corrigan type. The first Wassermann test was positive, but a thorough investigation for syphilis, including a provocative series, was negative. The spleen was not palpable.

One transfusion was given, and by April the blood count was quite satisfactory. Another severe nosebleed then reduced the hemoglobin from 63 to 43 per cent, and the erythrocytes from 4,190,000 to 3,650,000. Again there was gradual improvement.

The patient visited the Clinic again in July, 1921; his general condition was greatly improved, although he still complained of oozing from the gums, petechial eruptions, purpura, and prolonged bleeding from cuts caused by shaving. His hemoglobin was 66 per cent, erythrocytes 4,860,000, and leukocytes 5,100. The platelets were 284,000, but in spite of this the bleeding time was very much prolonged, thirty-three minutes. The coagulation time by the Boggs method was six and one-half minutes, and by the Lee method, seven minutes. The prothrombin time was slightly prolonged. The spleen was not palpable. The tonsils were infected, but tonsillectomy was not undertaken.

At our request, the patient again returned February 6, 1924. He had had no very severe attacks of hemorrhage but was afraid to exert himself because of recurrent petechial eruptions and oozing from the gums. Various readings of the platelet count were as follows: 182,000, 72,000, 94,000, 102,000, 84,000, 172,000, and 260,000. A tourniquet test was positive and the clot was nonretractile. Hemoglobin and erythrocytes were normal; the leukocytes numbered 7,000. Coagulation time by the Boggs method varied from six to nine minutes, and by the Lee method was eleven minutes. The bleeding time on five successive tests was normal except once, when it was twenty minutes. Prothrombin time was quite definitely prolonged. A fragility test gave a normal reading. The spleen, at this time, was not palpable but there was a slight tenderness on palpation in the region around it. Although the patient was in very good general condition, the hemorrhagic manifesta-

tions not extreme, and the coagulation factors not markedly disturbed, splenectomy was decided on because of the former history of recurrent attacks of severe hemorrhage over a period of twelve years.

Splenectomy was performed February 22, 1924 (C. H. Mayo). The smaller vessels oozed quite noticeably during the operation until after the spleen had been removed, when all bleeding ceased. The continuous bleeding from the gums ceased entirely after operation. On the fifth day there was slight oozing from the nostrils but after that time there was no bleeding whatever. The petechial eruption, which was present at the time of the operation, gradually disappeared. Two weeks after splenectomy the platelet count was 260,000, coagulation time by the Boggs method nine and one-half minutes, and bleeding time two minutes. The spleen weighed 220 gm. There was no recurrence of bleeding, and ten months after operation the patient was well and working regularly.

*Comment.*—The patient in this case had had recurrent bleeding for twelve years. At the time of operation his general condition was very good, but the bleeding was somewhat troublesome and partially incapacitated him for work. The spleen was not palpable. The demonstration, therefore, of apparent cure in a case in which the spleen was not palpable and in which the symptoms were mild at the time of operation, is important. The spleen was found to be only slightly enlarged, 220 gm. This is the only case of the series in which an estimation of the fragility of the erythrocytes was made; the readings were normal.

*Case 4.*—A girl, aged eleven years, came to the Clinic March 11, 1924, because of epistaxis. The family history was negative. A history of hemorrhagic disease was not obtained. The patient's infancy had been normal. She had had measles with pneumonia at two, whooping cough at four, influenza at five, and chicken pox at nine. Six months after influenza, or five and one-half years before examination, she began to have frequent nosebleeds. Petechiae and purpuric spots were noted at about the same time. She would bleed every week, often for as long as thirty minutes. The tonsils had been removed four years before, without excessive bleeding. Three years previously she had been in the hospital for seven weeks and was transfused. She had a right otitis media at about the same time. Teeth had been extracted one year before, without excessive bleeding. Aside from the epistaxis, petechiae, and purpura, there had been no bleeding. At the time of admission she was having nosebleeds two or three times a week.

On examination the child was overweight, weighing 92 pounds; a few petechial hemorrhages and purpuric areas were present; there was an area of purpura on the hard palate. The hemoglobin by the Dare method was 56 per cent; erythrocytes numbered 3,480,000, and leukocytes 9,800. The differential count showed lymphocytes 38.0 per cent, large mononuclears 1.5 per cent, transitionals 4.0 per cent, neutrophils 55.0 per cent, eosinophils 1.0 per cent, basophils 0.5 per cent, anisocytosis slight, poikilocytosis slight, and

polychromatophilia slight. Three platelet counts varied from 46,000 to 54,000. The coagulation test by the Boggs method was five minutes, and by the Lee method fourteen minutes. The bleeding time varied from thirty-eight minutes to one hour. The prothrombin test showed no coagulation in six hours and there was retractility of the clot. A tourniquet test was positive. The spleen was easily palpable.

The patient was given a transfusion March 18, 1924, and splenectomy was performed March 19 (C. H. Mayo). The spleen weighed 168 gm. The platelet count rose the day after operation to 100,000, and the bleeding time fell to eight minutes. The third day the platelet count was 98,000 and the bleeding time was five minutes. The fourth day the platelet count was 258,000, the fifth day 430,000, and the sixth day 208,000, while the bleeding time had become reduced to two and one-half minutes. On the seventh day the prothrombin time was still prolonged, no coagulation occurring at the end of two hours; retractility of the clot was still absent at the end of two hours. The patient had nosebleed the second day after operation, but none subsequently up to the time of dismissal, three weeks after operation, and the petechiae and purpura had disappeared. The platelet count three weeks after operation had fallen to 50,000; the prothrombin time had become normal.

The patient caught cold on her way home and from four to six weeks after splenectomy had a few slight nosebleeds, and a few petechiae appeared. These promptly ceased. Nine months after operation the patient had had no recurrence of bleeding, and was in excellent health.

*Comment.*—This case demonstrates the good effect of splenectomy in a girl, aged eleven, who had symptoms for over five years. Epistaxis was the principal type of bleeding. It will be noted that slight nosebleed was present for two or three days, and again a month after operation after catching cold; the nosebleeds were accompanied by a petechial eruption. However, the nosebleed ceased and the petechiae promptly cleared up and had not recurred nine months later.

#### PATHOLOGIC PICTURE OF EXTIRPATED SPLEENS (MACCARTY)

*Case 1,* weight of spleen 210 gm. The gross appearance was not abnormal except for a slight increase in size and weight. The microscopic examination revealed the presence of the normal structures of the spleen. Changes were not visible in the malpighian corpuscles, the reticulum, the cells of the sinusoids or venules, the blood vessels, muscular trabeculae, capsule or pulp. An increase in the number of neutrophilic leukocytes in the splenic pulp was a prominent feature. A moderate amount of brown pigment was present. A neutrophilic myelocyte was occasionally found; the germ centers were apparently active.

*Case 2,* weight of spleen 200 gm. The gross appearance was not different from that of the normal spleen. As in Case 1, nothing of an abnormal character was recognizable with the exception of an increase in the number of neutrophilic leukocytes; more than 50 leukocytes were seen in a

single oil immersion field, and several eosinophilic myelocytes were found. A small amount of brownish pigment was present in the pulp; the germ centers were apparently active.

*Case 3*, weight of spleen 220 gm. The spleen was grossly and microscopically normal with the exception of an increase in the number of neutrophilic leukocytes. In this case, also, numerous eosinophilic leukocytes were present.

*Case 4*, weight of spleen 168 gm. This spleen was not distinguishable from a normal one except that the blood vessels in the malpighian corpuscles were hyalinized. Some pigment was present but no more than is sometimes found in the normal spleen. There was, perhaps, an increase in the number of neutrophilic leukocytes.

#### DISCUSSION

It is not necessary to review in detail the features of hemorrhagic purpura, or essential thrombocytopenia, as exemplified in these cases. My own experience with splenectomy for purpura hemorrhagica leads me to conclude with a fair degree of certainty that the procedure is a curative measure. There is a very definite consentaneity between the results obtained in this series and those which have been reported in the literature, now numbering more than twenty.

Several points, however, may be mentioned. The platelet count is not at all times below 100,000 in severe cases of hemorrhagic purpura. There may be periods, usually of only a day or two, during which the count will return to normal. The platelet level as a whole, however, when numerous counts are taken, will be found to be low. The platelet count after splenectomy is not at all times above 100,000, but the platelet level as a whole probably remains higher than before splenectomy. More platelet counts over longer periods after operation are necessary to demonstrate this fact definitely. A low platelet count not infrequently occurs after splenectomy without the recurrence of bleeding.

A study of the platelets is important, especially with regard to the morphologic and chemical abnormalities present in purpura hemorrhagica. Numerically it has been demonstrated that in normal dogs the number of platelets in the blood of the splenic vein is not less than in that of the splenic artery; the platelet count has been reported to be low in the blood from the splenic vein in cases of hemorrhagic purpura, although the accuracy of the observation can be questioned because of difficulties of technic. The number of platelets in venous blood from various parts of the

body of the normal dog seems to be slightly higher than in arterial blood.<sup>5</sup>

The presence of an abnormally large number of neutrophilic polymorphonuclear leukocytes in the spleen is apparently the outstanding feature, from a pathologic standpoint, of purpura hemorrhagica, and it would seem permissible to say that the splenomegaly of this disease is in reality an acute or subacute splenitis.

Severe respiratory infections following splenectomy have, in a few instances, been accompanied by a slight recurrence of bleeding. In one case the reaction accompanying vaccination was apparently responsible for a petechial eruption one year after splenectomy.

Frank, in 1915, suggested that hemorrhagic purpura and acute aplastic anemia might be manifestations of the same disease, in one instance the production of platelets being chiefly affected, in the other a complete aplasia of the bone marrow being present. This conclusion does not, however, appear to be logical in view of the evidence which points to increased destruction of platelets in hemorrhagic purpura, either within the spleen or partly as a result of abnormal splenic function, and the absence of evidence pointing to permanent damage to the bone marrow. The very prompt rise in the platelet count after splenectomy would seem to preclude serious depression of the function of the bone marrow. Indeed it is more likely that hemorrhagic purpura and acute aplastic anemia are fundamentally as different as hemolytic jaundice and pernicious anemia; and that there may be present a condition of the platelets in hemorrhagic purpura which is analogous to the increased fragility of the erythrocytes in hemolytic jaundice.

#### BIBLIOGRAPHY

1. Brill, N. E., and Rosenthal, N.: The treatment of splenectomy of essential thrombocytopenia (purpura hemorrhagica). *Tr. Assn. Am. Phys.*, 1923, xxxviii, 294-314.
2. Brill, N. E., and Rosenthal, N.: The curative treatment by splenectomy of chronic thrombocytopenic purpura hemorrhagica. *Am. Jour. Med. Sc.*, 1923, clxvi, 503-512.
3. Frank, E.: Die essentielle Thrombopenie. *Berl. klin. Wehnschr.*, 1915, i, 454-458; 490-494.
4. Giffin, H. Z., and Holloway, J. K.: Hemorrhagic purpura. *Med. Clin. N. Amer.*, 1923, vii, 241-248.
5. Holloway, J. K., and Blackford, L. M.: Comparison of the blood-platelet count in splenic, arterial, and venous blood. *Am. Jour. Med. Sc.*, 1924, clxviii, 723-729.

6. Kaznelson, P.: Verschwinden der hämorrhagischen Diathese bei einem Falle von "essentieller Thrombopenie" (Frank) nach Milzextirpation. Splenogene thrombolytische Purpura. Wien. klin. Wchnschr., 1916, xxix, 1451-1454.
7. Kaznelson, P.: Thrombolytische Purpura. Ztschr. f. klin. Med., 1919, lxxxvii, 133-164.
8. Kaznelson, P.: Beiträge zur Pathogenese hämorrhagischer Diathesen. III. Deutsch. Arch. f. klin. Med., 1919, cxxviii, 119-130.
9. Kaznelson, P.: Beobachtungen über paroxysmale Kältenhäoglobinurie und Kälteikterus. Deutsch. Arch. f. klin. Med., 1921-1922, cxxxviii, 46-57.
10. Mayo, W. J.: The splenomegalias. Boston Med. and Surg. Jour., 1924, cxc, 1-6.
11. Port and Aiyama: Quoted by Cohn, I., and Lemann, I. I.: In: Splenectomy as a treatment for purpura hemorrhagica. Surg., Gynec. and Obst., 1924, xxxviii, 596-604.

## DISCUSSION

DR. J. P. SCHNEIDER (Minneapolis): Mr. Chairman—We owe a great deal to Dr. Giffin's masterly summing up of the main features of this condition and presenting the results obtained by splenectomy in particularly the chronic type of this disease. Personally, I am quite in doubt about the efficiency of splenectomy, for, to quote Josh Billings, it would seem "better to know less than to know so many things that ain't so"—about purpura.

In the first place, our present methods of determining the bleeding and coagulation time are full of pitfalls and errors, as can be well appreciated from the multiplicity of methods, all wanting in accuracy or filled with neglected factors. It is much safer to make the diagnosis of idiopathic purpura by clinical judgment than to place dependence upon laboratory tests too freely.

Brill's two cases splenectomized in 1922 and published in 1923, aroused considerable interest and led to calling the type thrombocytopenic purpura—to my idea a misnomer.

In reviewing the literature, I find that five patients have been reported as having had recurrences of bleeding. The following should be considered as points against splenectomy:

1. Both bleeding and coagulation time are influenced by as yet undiscovered factors—to witness, sodium citrate prevents blood from clotting in vitro; in vivo, it hastens coagulation shortly after introduced and drives platelets out of blood stream, followed by liberation of much enzyme.

2. In one of Brill's cases, during delivery of the spleen, the bleeding time was reduced from ten minutes just before the operation to two minutes—as a matter of fact, it was shorter immediately after operation than any time during the subsequent six months' observation. This phenomenon is, to my mind, of great significance, for it means the squeezing out into circulation of cytozyme, which acts on capillaries and influences their contractility, to say nothing of the pituitrin liberated by the surgical shock, which is a potent factor, as demonstrated by Kroch. The liberation is so rapid that the theory of the spleen being a factor *per se*, cannot well hold.

3. Most significant is the work of Bernhard and others, showing that if the splenic area after splenectomy in a spleenless patient is given deep roentgenotherapy, the same qualitative effect can be produced on the hastening of coagulation and lessening of hemorrhage as results from radiating the spleen. How do the proponents of the splenic theory explain that? Nor is that all, for radiating the lymph glands of the neck or mediastinum or merely removing the tonsils or adenoids will produce qualitatively the same favorable temporary result.

4. The platelet count very frequently, in x-rayed or splenectomized cases, returns to below normal, and yet clinically the patients are not bleeding.

The injury in purpura is toxic and not limited to one organ, but a reticulo-endothelial system injury involves, in some instances, a thrombopenia, particularly in the chronic case.

DR. MOSES BARRON (Minneapolis): There is an interesting form of purpura hemorrhagica which is very serious and frequently rapidly fatal. This form affects nursing women.

Dr. Giffin has spoken of the treatment of chronic cases. I would like to inquire whether he would advise operation for the more acute forms. I wish to emphasize what has been said relative to the importance of making a correct diagnosis. I saw a case very recently which was diagnosed purpura hemorrhagica which at autopsy proved to be a case of aplastic anemia. We must not undertake too lightly the operation of removing the spleen if we are to get results as successful as those reported by Dr. Giffin. Cases for operation must be chosen very carefully.

DR. GIFFIN (Rochester): I am very grateful for this excellent discussion. Patients with hemorrhagia are regularly examined for evidences of hemorrhagic purpura. It is necessary, of course, in the diagnosis of hemorrhagic purpura to be certain that local conditions are not present in the pelvis which may be the cause of hemorrhage.

The differential diagnosis of hemorrhagic purpura from aplastic anemia is important in connection with splenectomy. We performed splenectomy in one case of pernicious anemia of the chronic aplastic type and also in one case of acute aplastic anemia without benefit. Patients with acute aplastic anemia show a persistent leukopenia in addition to the hemorrhagic features and coagulation factors which might be confused with hemorrhagic purpura.

The spleen has not been enlarged in all of the cases that have so far been operated upon. The absence of a palpable spleen in the presence of definite features of hemorrhagic purpura would not be a contraindication to splenectomy.

Although we have no accurate data concerning the platelet level over a long period of time after splenectomy, the data which we have indicate that it will prove to be high with occasional dips below normal; whereas preceding operation the platelet count is low with occasional elevations to normal or above normal. There seems to be a period of adjustment after operation. Some of the cases show a slight recurrence of symptoms for several days immediately following operation and may also show slight hemorrhagic features following acute infections. It has been known that the platelet count rises after various



operations, including splenectomy for other conditions, but this rise, I believe, has been much less marked than that seen in cases of hemorrhagic purpura.

Radiotherapy has had only slight temporary effect in cases of hemorrhagic purpura. There has been no experience so far with the very acute cases of hemorrhagic purpura: the cases that have been operated on have been either mild cases of long duration or cases of a chronic remittent type. Absolute rest and, as far as possible, absolute quiet in bed are most important in the preparation of patients for operation. The least exertion frequently brings on bleeding. Transfusions have been given to bring the blood up to 3,000,000 or 3,500,000 cells and splenectomy has then been undertaken.

From the standpoint of the general practitioner the diagnosis of hemorrhagic purpura is not necessarily difficult. In the absence of a family history which might indicate hemophilia and in the presence of a history of recurring petechiae, purpura, bleeding from the mucous membranes, and menorrhagia over a period of years, the finding of a prolonged bleeding time upon clean-cut puncture of the ear is sufficient to make the diagnosis almost certain.

#### THE MOLLGAARD METHOD IN TUBERCULOSIS

The recently published book by Mollgaard and his collaborators on the new gold treatment of tuberculosis gives the properties of "Sanocrysin," which is sodium aurothio-sulphate, and the animal experiments which have been carried out. The serum from calves previously injected with killed tubercle bacilli and tuberculin, which is used in connection with the gold salt, is regarded as an antitoxic serum that neutralizes toxins liberated in the tuberculous animal by the action of the drug. Tests are reported on the effects of "Sanocrysin" and serum in calves injected intravenously with bovine tubercle bacilli. The results are said to be favorable, but the evidence is not convincing. The clinical reports in the book reveal that the treatment is of no value in miliary tuberculosis or in tuberculosis leptomeningitis and that in advanced and serious cases of pulmonary tuberculosis the treatment is perilous and offers "only a slight chance of recovery." It remains to be determined whether any better results can be obtained with the Sanocrysin-serum treatment than without it. There does not appear to be any reason for imagining that the particular gold salt used by Mollgaard can have any different effect than the other gold salts which have been investigated in the past and abandoned. At present there is no justification for rushing into the treatment of tuberculosis with this drug. (*Jour. A. M. A., Feb. 14, 1925, p. 516.*)

#### THE DICK TEST

The U. S. Treasury Department has not authorized the interstate sale of any Dick scarlet fever preparation. The Council on Pharmacy and Chemistry does not accept biologic products until they are licensed by the Treasury Department, and therefore has not considered the Dick scarlet fever preparation. (*Jour. A. M. A., Feb. 28, 1925, p. 699.*)

## THYROID ENLARGEMENT IN MINNEAPOLIS CHILDREN

CHESTER A. STEWART, M.D., Ph.D.

Assistant Professor of Pediatrics, University of Minnesota; Consultant, Pediatric, Lymanhurst Hospital for Tuberculous Children

Minneapolis

The development of a scientific, practical and effective method for the control and prevention of endemic goiter occupies a well established and important position among the recent triumphs in the field of preventive medicine. The adoption of public health measures on a large scale directed toward the prevention of endemic goiter probably is dependent to a considerable extent upon the adequate appreciation of the extent to which the existing conditions constitute a public health problem.

#### NON-PALPABLE THYROIDS

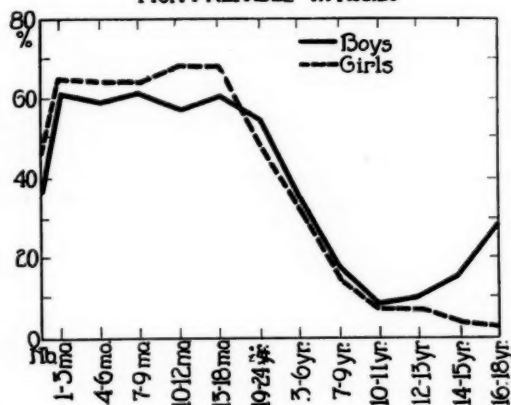


Fig. 1

Studies by Marine and Kimball (1917), Levin (1921), Olesen and Clark (1924) and by numerous others have demonstrated the wide-spread prevalence of endemic goiter in America. In the United States the goiter belt is very extensive (M. Ross, 1924), although within the area the severity and incidence of this condition among the population varies considerably (C. H. Mayo, 1921). Due to this variability, the period at which the employment of prophylactic measures should be instituted probably depends to some extent upon local conditions. A study of the prevalence of thyroid enlargement among 1,906 Minneapolis children ranging from birth to eighteen years of age was undertaken to ascertain not only the incidence of this



condition, but also to elicit if possible some approximate idea as to when prophylactic measures might be instituted most profitably.

In this study the size of the thyroid was estimated by palpation in each case individually. With regard to size, the glands were divided into five groups as follows: (1) non-palpable thyroids; (2) very small or barely palpable thyroids; (3) slightly but definitely enlarged thyroids; (4) considerably enlarged thyroids; and (5) the greatly enlarged thyroids. No attempt was made to classify the enlarged glands as to the type of enlargement present.

The percentage of non-palpable thyroids shows marked changes between the ages of birth and eighteen years, tending to be definitely lower at birth for each sex (Tables I and II) than at any subsequent period up to the age of two years. Between the third and sixth year the number of thyroid glands in this group is distinctly lower than at any previous age. Subsequently this group of undoubtedly normal glands continue to decrease, reaching a minimum percentage value for each sex between the ages of twelve and thirteen. At this period the number of non-palpable thyroid glands has fallen to approximately one-twentieth the number present during the greater part of the first two years of life. After the thirteenth year the percentage of non-palpable thyroids tends to definitely and progressively increase in the case of the boys,

whereas in the case of the girls the non-palpable thyroids continue to be comparatively rarely present at least until the eighteenth year. In addition to this difference noted between the sexes, the averages when smoothed by graphic interpolation (Fig. 1) indicate a slightly higher percentage of thyroid glands belonging to this group

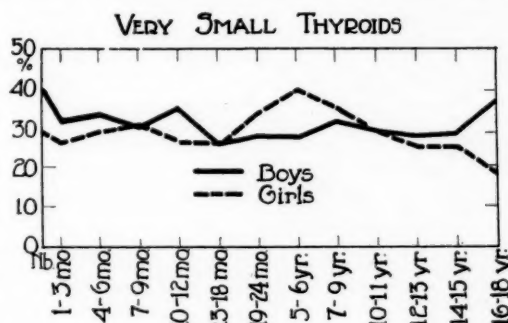


Fig. 2

for the girls during the first two years of life and a slightly lower average thereafter. The marked decrease in the number of non-palpable thyroid glands present after the age of two years strongly indicates that the tendency for thyroid enlargement begins at this early age, which enlargement possibly may not attain proportions sufficient to attract clinical attention as to its prevalence until after a lapse of several years.

TABLE I  
BOYS

Table showing age, number of cases and percentage of cases of non-palpable, very small, slightly, considerably and greatly enlarged thyroid glands.

Age	No. of cases	Non-palpable %	Very small %	Slightly enlarged %		Greatly enlarged %
				ly en-	ly en-	
Newborn ...	49	34.7	42.9	18.4	0.0	2.0
1-3 months..	113	61.9	31.9	3.5	2.7	0.0
4-6 months..	86	60.5	32.6	6.9	0.0	0.0
7-9 months..	91	54.9	36.3	8.8	0.0	0.0
10-12 months	47	68.1	21.3	10.6	0.0	0.0
13-18 months	66	50.0	36.4	13.6	0.0	0.0
19-24 months	63	63.5	20.6	15.9	0.0	0.0
3-6 years....	19	31.6	26.3	42.1	0.0	0.0
7-9 years....	57	10.5	35.1	49.1	5.3	0.0
10-11 years..	57	10.5	33.4	35.1	21.0	0.0
12-13 years..	53	3.6	18.9	49.1	28.4	0.0
14-15 years..	76	14.5	30.3	36.8	18.4	0.0
16-18 years..	66	28.8	36.4	27.2	7.6	0.0

TABLE II  
GIRLS

Table showing age, number of cases and percentage of cases of non-palpable, very small, slightly, considerably and greatly enlarged thyroid glands.

Age	No. of cases	Non-palpable %	Very small %	Slightly enlarged %		Greatly enlarged %
				ly en-	ly en-	
Newborn ...	45	44.7	28.9	23.7	2.0	2.7
1-3 months..	88	64.8	26.1	9.1	0.0	0.0
4-6 months..	82	65.9	26.8	7.3	0.0	0.0
7-9 months..	77	61.0	33.8	5.2	0.0	0.0
10-12 months	43	65.1	30.2	4.7	0.0	0.0
13-18 months	53	75.5	15.1	7.5	1.9	0.0
19-24 months	56	64.3	32.1	3.6	0.0	0.0
3-6 years....	13	23.1	53.8	15.4	7.7	0.0
7-9 years....	54	7.4	31.5	48.2	12.9	0.0
10-11 years..	55	12.7	18.2	45.5	21.8	1.8
12-13 years..	76	2.6	36.8	38.2	22.4	0.0
14-15 years..	266	6.8	21.8	37.6	30.8	3.0
16-18 years..	155	3.2	18.1	44.5	31.6	2.6

The percentage of very small thyroid glands while fluctuating considerably at different ages shows no general trend or change with increasing age (Tables I and II). There is also no constant difference noted between the two sexes.

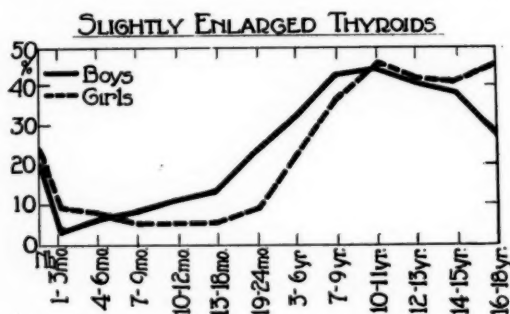


Fig. 3

Slight but definite enlargement of the thyroid is apparently more prevalent at birth than at any subsequent period during the first two years of life, this being particularly true in the case of the girls (Tables I and II, Fig. 3). After the second year for the girls and possibly earlier for the boys, the percentage of slightly enlarged thyroid glands steadily increases, reaching a maximum of incidence between the tenth and eleventh year (Fig. 3 curves smoothed by graphic interpolation). Subsequently the percentage of slightly enlarged thyroids apparently decreases for the boys, whereas for the girls the prevalence of this type of enlargement appears to be more persistent.

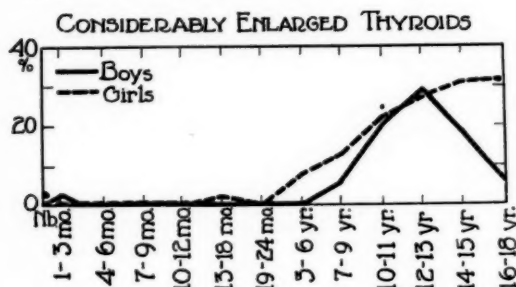


Fig. 4

Thyroid glands classed as considerably or markedly enlarged were found in 2 per cent of the newborn girls and 2.7 per cent of the boys between one and three months of age. Thereafter thyroids of this type were not encountered during the first

two years of life aside from a single instance of a girl baby, 16 months of age. For the boys, thyroid glands that were considerably enlarged reappeared between the ages of seven and nine years, being present in 5.3 per cent of cases at this period. Subsequently this type and degree of enlargement progressively increased, reaching a maximum incidence of 28.4 per cent (Table I) between the twelfth and thirteenth years, and subsequently decreased, averaging 7.6 per cent between 16 and 18 years of age. In the case of the girls thyroid glands showing considerable or marked enlargement were present in 7.7 per cent of cases between the third and sixth year (Table II). With advancing age the percentage of glands classified in this group steadily increased, reaching an incidence of 31.6 per cent between the ages of 16 and 18. The continued greater prevalence of considerable enlargement of the thyroid in girls as compared with boys after the thirteenth year is well shown in Figure 4.

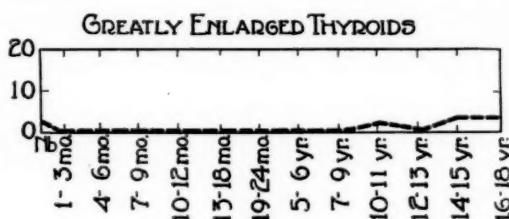


Fig. 5

A greatly or enormously enlarged thyroid gland was found in only one male baby at birth and at no subsequent periods. This degree of thyroid enlargement was also found in one individual case among the newborn girls examined, but subsequently was entirely absent until between the ages of ten and eleven years. Also between the fourteenth and the eighteenth years a few examples of this type of enlargement were encountered, but at no period was its incidence very high (maximum 3.0 per cent at fourteen to fifteen years, Table II, Fig. 5).

In order to obtain a clearer conception of the prevalence of thyroid enlargement of clinical significance at various ages the data were averaged, combining the percentages of non-palpable and of the very small thyroid for each age group (sexes separated) under the assumption that the thyroids of these groups were essentially normal. The per-

percentage of thyroid glands classified as slightly enlarged, considerably enlarged, and greatly enlarged were likewise averaged for each age group (sexes separated) and were considered as representing glands which presented enlargement of clinical significance. The results obtained by this combination of data are represented graphically in Figures 6 and 7. The figures show a prevalence of thyroid enlargement in more than 20 per cent of cases

for each sex about the age of puberty. Subsequently these non-palpable glands are found with increasing frequency among the boys, but continue to be rarely present among the girls at least until the eighteenth year.

The percentage of very small thyroid glands fluctuates considerably during childhood, but shows no general trend with increasing age.

Slight and considerable enlargements are more prevalent at birth than at other periods during infancy. After the third year these types of enlargement increase in frequency, reaching a maximum about the age of puberty. The considerable enlargement is apparently more persistent among the girls after this period than among the boys.

At no period of life was great enlargement of the thyroid gland as prevalent as hypertrophies of lesser degree. This type of enlargement is very occasionally found in infancy, and subsequently its occurrence is limited practically to girls about the time of puberty or later.

Since the administration of iodine is more efficient in the prevention than in the cure of simple goiter, the prophylactic treatment of this condition

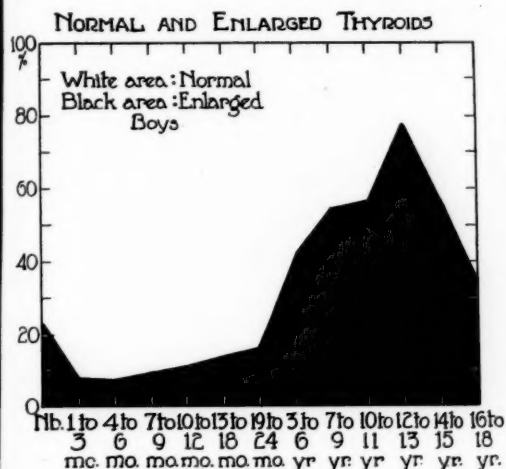


Fig. 6

at birth, the incidence being higher at this than at any subsequent period during the first two years of life. Later the prevalence of thyroid enlargement increases enormously. After the age of twelve to thirteen years, however, this condition apparently occurs with decreasing frequency only among the boys. Inspection of the data (Tables I and II) show that the thyroid enlargement present during early childhood consists for the most part in slight enlargement. Considerable or great enlargement of the gland is not prevalent to any considerable degree until after the seventh year. At all periods of life, however, slight hypertrophy of the thyroid gland is more common than the more marked degrees of hypertrophy.

#### CONCLUSIONS AND SUMMARY

The percentage of thyroid glands classed as non-palpable is definitely lower at birth than at any subsequent period during the first two years of life. After the third to sixth year of age this group of undoubtedly normal thyroids progressively decreases, reaching a minimum percentage incidence

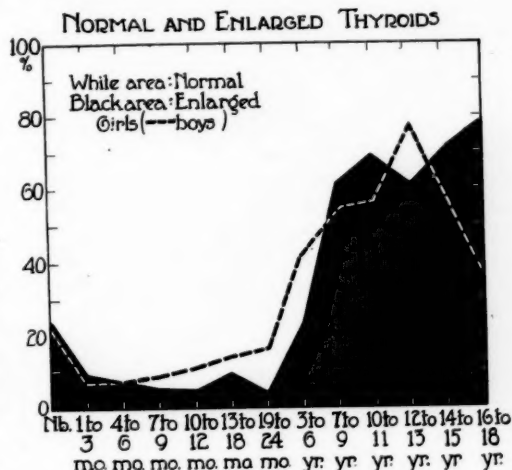


Fig. 7

probably should be instituted rather early in life, preferably before even slight enlargements of the gland make their appearance in any considerable percentage of cases. Simple goiter in children probably can be almost completely eradicated if iodine is administered to mothers during the latter part of pregnancy and to children during each year after the ages of three to six until puberty.

## LITERATURE

- Marine, D., and Kimball, O. P.: The prevention of simple goiter in man. A survey of the incidence and types of thyroid enlargements in school girls. *Jour. Lab. and Clin. Med.*, 1917, iii, 40.
- Olesen, R.: Thyroid survey of 47,493 elementary school children in Cincinnati. *Pub. Health Rep.*, July 25, 1924, xxxix, No. 30.
- Olesen, R., and Clark, T.: Thyroid enlargement among Minnesota school children. *Pub. Health Rep.*, Oct. 10, 1924, xxxix, No. 41.
- Levin, S.: One thousand one hundred forty-six goiters in one thousand seven hundred eighty-three persons. *Arch. Int. Med.*, 1921, xxvii, p. 42.
- Ross, M.: The goiter belt. *The Survey*, June, 1924, iii, No. 5.
- Mayo, C. H.: The thyroid. *Med. Record*, July, 1921, No. 4.

## VALERIAN OMITTED FROM USEFUL DRUGS AND AMYL VALERATE OMITTED FROM N. N. R.

The Council on Pharmacy and Chemistry reports that for some years it has been viewing the claims for the therapeutic value of valerian and valerian preparations and substitutes with increasing skepticism. During the period 1915 to 1921, the Council questioned the claims made for a number of proprietary valerian preparations then in New and Non-official Remedies. In the end these products were omitted because they were off the market. Valerian has been retained in Useful Drugs because it is used to a considerable extent. This use, however, appears to be based on tradition. The Council reached the conclusion that there is no acceptable evidence for the therapeutic usefulness of valerian or the valerian substitutes now on the market. It, therefore, decided (1) to omit valerian from Useful Drugs; (2) to omit the general article "Valeric Esters" along with amyl valerate (the only preparation now in the book) from New and Non-official Remedies, and (3) to admit to New and Non-official Remedies no preparation which depends on valerian or its constituents unless satisfactory new evidence for its therapeutic value is submitted. (*Journal A. M. A.*, Dec. 13, 1924, p. 1941.)

## BUTYN AND EPINEPHRIN

As a result of animal experiments recently reported by Hirschfelder, Backer and Jennison, "the addition of epinephrin to solutions of cocaine and saligenin increases their tendency to cause local edema. This is not the case with procain and butyn." According to New and Non-official Remedies, 1924, the use of butyn for injection anesthesia or for special anesthesia does not appear promising, since its toxicity is materially greater than that of cocaine. Butyn is a substitute for cocaine in surface anesthesia, as for the eye, nose and throat; it acts through intact mucosa almost as effectively as cocaine; solutions of butyn are non-irritant. (*Jour. A. M. A.*, Feb. 28, 1925, p. 699.)

## THE RELATIVE MERITS OF THE VARIOUS TREATMENTS OF PEPTIC ULCER\*

DONALD C. BALFOUR, M.D.  
Rochester, Minnesota

Of all diseases within the abdomen, peptic ulcer stands first in the number and variety of treatments which have been suggested for its cure. While many of the methods have been abandoned, there remain a sufficient number of those possessing real merit to create some uncertainty as to their indications. Yet it is on a knowledge of the value of these different methods, and of their correct application, that the best results in the treatment of chronic peptic ulcer depend.

The methods which are worthy of discussion include both medical and surgical procedures. There are many variations in the medical treatment of ulcer, but the basis is essentially the same in all. The surgical procedures of unquestioned merit are: (1) excision alone; (2) excision with gastroduodenostomy; (3) gastro-enterostomy, with or without excision; and (4) partial gastrectomy.

In considering the merits of any treatment for peptic ulcer, it is essential that the very marked distinctions between gastric and duodenal ulcer be kept clearly in mind. The indications for medical treatment depend largely on the situation of the lesion. In chronic gastric ulcer prolonged medical treatment is justified only when surgery is absolutely contraindicated because of the age or the condition of the patient. As a temporary expedient, however, medical treatment may not only be justifiable, but of marked value in improving the condition of those patients who have become bad surgical risks because of repeated hemorrhages, extensive subacute local inflammatory changes, or toxemia from gastric retention. The more familiar we become with the uninterrupted course of chronic gastric ulcer, which is one of progressive disability, the more certain we become of the fact that prolonged medical treatment is never justified if the patient is fit for operation.

In cases of chronic duodenal ulcer such serious objections to medical treatment do not exist, since the symptoms are usually not so severe, the disability so great, nor the danger of fatal complications so marked as in cases of gastric ulcer. Medi-

\*Read before the Minnesota State Medical Association, St. Cloud, October 8-10, 1924.



cal treatment of chronic duodenal ulcer is, therefore, not uncommon, but the absence of reliable data concerning the late results of such treatment suggests that the results are not so satisfactory as might be wished. Undoubtedly certain patients are relieved of the symptoms of ulcer under medical treatment, and since post-mortem evidence shows that ulcers may heal spontaneously, most surgeons agree that one thorough course of medical treatment of uncomplicated duodenal ulcer is justifiable before surgical intervention is advised.

The groups of patients with duodenal ulcer who may be treated medically are: (1) patients under twenty-five years of age; (2) patients with mild symptoms of short duration; (3) patients in whom ulcer is found incidentally (in roentgenologic examinations); and (4) patients whose general condition because of age, or because of other disease, makes operation a greater menace than the ulcer.

The question of how long the medical treatment of chronic duodenal ulcer should be persisted in depends largely on the symptomatic response in the individual patient, the economic status, the general health, and the willingness to follow the treatment. If the patient's general condition does not permit operation, the dietary and therapeutic treatment must be continued to some degree indefinitely, but if the patient is in a satisfactory condition for operation, definite failure of the treatment to control the symptoms, or prevent recurrence of attacks, calls for operation. The majority of patients who elect medical treatment return sooner or later with the same experience of alternating periods of relative comfort and distress, regardless of how rigidly they have adhered to treatment. Then, because the treatment has proved too irksome, or because it has failed to control symptoms, they seek more positive measures of relief. The economic status of the patient is an important factor since few patients can afford, or are willing, to give the necessary time to carry out all the details which comprise the modern medical treatment of ulcer. In most cases of chronic duodenal ulcers, therefore, surgical treatment is sooner or later indicated.

Of the surgical procedures at our disposal, each has its merits, the essential point being the selection of the best method in the individual case. Just as it is necessary in discussing the medical treatment of peptic ulcer to distinguish clearly between gastric and duodenal ulcer, so in the surgical

treatment it is equally important to realize that gastric and duodenal ulcer are two distinct entities. It is generally recognized that the fundamental principle in the successful treatment of chronic gastric ulcer is the removal of the ulcer, whenever feasible. The method of removal varies with the size and situation of the ulcer. For small, accessible ulcers, local excision by cautery or knife, combined with gastro-enterostomy, gives excellent immediate and late results, and the procedure is usually both safe and simple. Occasionally, when such a small ulcer is near the pylorus, and the pyloric end of the stomach and the duodenum can be easily mobilized, local excision followed by gastroduodenostomy, or pylorotomy by the Billroth I method, may be employed. In neither the immediate nor late results, however, do these methods show any advantage over excision and gastro-enterostomy, and there are certain inherent disadvantages to plastic operations at the pylorus which may mitigate against the best end-results. For larger ulcers, partial gastrectomy is the operation of choice since it cannot be determined whether or not such ulcers are malignant, and it is well established that all chronic gastric ulcers are potentially malignant. It is probable, therefore, that partial gastrectomy will be more widely employed in the treatment of gastric ulcer in the future, but the prevailing current impression is that the sacrifice of a large part of a normal stomach for a small lesion which can be safely and completely removed by excision does not appear to be justified. Gastro-enterostomy alone should only be done in cases of chronic gastric ulcer in which it is not feasible to remove the lesion. The late results are uncertain, not only because of the indifferent relief of symptoms, but because of the serious danger of malignancy developing in the unremoved lesion. The indications for the various procedures in chronic gastric ulcer are represented by the types of operation performed in the Mayo Clinic during the last ten years. From 1914 to 1924, 1,228 operations for chronic gastric ulcer included: (1) cautery excision and gastro-enterostomy, 342 (27.8 per cent); (2) knife excision and gastro-enterostomy, 237 (19.2 per cent); (3) partial gastrectomy, including Billroth I and II, retrocolic Polya, antecolic Polya, sleeve resection, and so forth, 197 (16.04 per cent); (4) excision and gastroduodenostomy, 29 (2.3 per cent); (5) gastro-enterostomy, 250 (20.3 per cent).



In the surgical treatment of chronic duodenal ulcer, one fact stands out: that no one operation, even when well suited to the individual case, will give perfect results. Because of this fact, surgeons have sought, by constant effort, to improve the results by the modification of old methods, or the introduction of new. Many of these have not withstood the test of time, but there are at present four surgical procedures for chronic duodenal ulcer which should be considered: (1) gastro-enterostomy, with or without excision of the ulcer; (2) pyloroplasty or gastroduodenostomy, with or without excision; (3) excision alone; and (4) partial gastrectomy.

The merits of gastro-enterostomy for chronic duodenal ulcer can be judged by its long-standing popularity. It was on the results of this operation that the surgical treatment of peptic ulcer became firmly established. Much of the recent criticism of gastro-enterostomy has been unfair, since it has to a large extent been based on failures due to the abuse of the operation rather than on the good results following its proper performance in cases in which adequate indications existed. In suitable cases satisfactory results can be anticipated in more than 90 per cent.

I recently reviewed 1,000 cases of chronic duodenal ulcer in which gastro-enterostomy had been performed more than ten years before, and found that 88 per cent of the patients reported satisfactory relief from their ulcer symptoms. The operation is safe, the mortality rate being between 1 and 2 per cent; it is usually simple, and it can often be done when any other procedure is definitely contraindicated. These facts explain its wide application. Of 6,665 cases of chronic duodenal ulcer coming to operation in the Mayo Clinic, gastro-enterostomy has been performed in 5,755 (86.35 per cent).

To attain the best results from gastro-enterostomy, a safe principle to follow is that the more extensive the lesion, the more definitely is the operation indicated, and the more certain are its results. Consequently, it is in cases of long standing that the operation is most effective, particularly when potential or actual obstruction exists. The advisability of removal of the ulcer at the time of gastro-enterostomy must be determined in each case, but the necessity for it is comparatively infrequent. In the Mayo Clinic, excision of the

duodenal ulcer has been done in addition to gastro-enterostomy in only 2.18 per cent of the cases.

Operations at the outlet of the stomach, either those embodying a reconstruction of the pylorus, or a gastroduodenostomy without division of the pylorus, have a definite though limited place in the treatment of chronic duodenal ulcer. Many methods have been devised for carrying out these operations, but it is significant that none has attained widespread use. The results of such operations in the Mayo Clinic have not been so satisfactory as the results of gastro-enterostomy, and they have been performed in selected cases, chiefly when gastro-enterostomy, because of technical obstacles, was inadvisable. Under such circumstances a large pyloroplasty is a useful substitute for gastro-enterostomy. The chief merit of pyloroplasty is that it permits inspection of the mucosa of the duodenum and pyloric end of the stomach. A knowledge that multiple ulcers are present is of value, both from the standpoint of operative procedure and of interpreting disappointments after operation, particularly the recurrence of hemorrhage. The advantage of excision of a duodenal ulcer, which is usually possible with pyloroplasty, is a doubtful one and, in other than exceptional cases such as the bleeding type of ulcer, is not necessary. The chief disadvantage of operations at the outlet of the stomach is that they do not have so positive an effect in reducing the acidity of the gastric juices, or in maintaining that reduction, and since the value of any operation on the stomach is largely determined by its effectiveness in these respects, such a disadvantage is serious. In the 6,665 cases of chronic duodenal ulcers in which operation was performed at the Mayo Clinic, pyloroplasty and gastroduodenostomy were employed in only 4.07 per cent.

A small, non-indurated ulcer of the anterior wall of an easily mobilized duodenum lends itself readily to excision by knife or cautery. In a number of cases of this type of ulcer, in which the symptoms are mild and other disease is present in the abdomen, the ulcer has been excised, the opening closed, and no further operative procedure carried out. Subsequently, the removal of all foci, and dietary treatment are advised. Judd has recently been carrying out local excision more often. This method of treatment would seem ideal because of its simplicity in principle and technic, but since the operation itself cannot protect the patient

against the formation of further ulcers, the end-results are problematic.

The most interesting recent development in gastric surgery has been the advocacy of partial gastrectomy for duodenal ulcer. There seems little reason to believe that this operation will attain much popularity since it necessitates the removal of a large part of normal stomach to relieve a benign condition of the duodenum which can be satisfactorily dealt with by a simple indirect operation in all but a small percentage of cases. The argument that partial gastrectomy obviates the possibility of subsequent ulceration is not absolutely sound, since secondary ulceration may and does occur after partial gastrectomy. Moreover, since the recurrence of ulceration after gastro-enterostomy is only 2 per cent, a routine partial gastrectomy is hardly justifiable to prevent such a slight liability. It seems more reasonable to reserve partial gastrectomy for the exceptional cases of duodenal ulcer in which secondary ulceration does occur. Partial gastrectomy may, however, be amply justified in gastric ulcer.

The relative merits of the different surgical procedures for chronic duodenal ulcer are indicated in the following tabulation, which shows how they were employed in the 6,665 cases at the Mayo Clinic:

Operation	Cases	Per Cent
		of Total
Gastro-enterostomy . . . . .	5,755	86.35
Pyloroplasty, gastroduodenostomy	271	4.07
Excision alone . . . . .	260	3.90
Partial gastrectomy . . . . .	30	0.45
Miscellaneous . . . . .	359	5.23

#### DISCUSSION

DR. A. C. STRACHAUER (Minneapolis): The statistics presented by Dr. Balfour conclusively prove that gastro-enterostomy is an extremely satisfactory operation in the majority of instances when properly performed. One of the principal reasons that it will probably continue to be the mainstay is that in most cases of ulcer of the duodenum it is the only operation which can be performed. Unfortunately, due to the anatomical location of the majority of the ulcers, resection or pyloroplasty, or both, can not be safely performed.

Gastroenterostomy is, indeed, a wonderful operation. It has survived much abuse: poor technique, including unabsorbable suture material, the long loop and the short loop, loops to right and loops to left, the various positions and angles for the opening, including the anterior and posterior, and its performance even in the absence of ulcer, let alone its positive indications.

Gastroenterostomy is performed in the majority of cases because it is the only operation that can be performed, and not because it is the ideal operation. Whenever safely possible, the ulcer, whether in the stomach or duodenum, should be eradicated. Removal alone constitutes actual cure, and obviates the complications of hemorrhage, perforation and malignant degeneration. The practicability of removing the ulcer depends largely on the experience and ability of the surgeon, and no hard and fast rules can be set. As a matter of fact, it is only after the abdomen has been opened that a decision can be made as to the type of procedure indicated in the special case at hand. The case in each instance must be individualized and the surgeon should be thoroughly familiar with the indications and contra-indications and the technique of all of the modern operations. The surgeon of experience can prophesy just about the degree of success and benefit to be derived from a gastroenterostomy in any given case.

There are two indications for gastroenterostomy. One, the presence of the ulcer with obstruction; two, ulcer with hyperacidity, or both. In the case of obstruction the patient is relieved by providing a new opening, so that the stomach can readily empty itself. In the case of the ulcer with hyperacidity the gastroenterostomy opening permits the entrance into the stomach of the alkaline contents of the duodenum, that is the bile, pancreatic juice and Brunner's glands secretion, thus neutralizing in part the hyperacidity present and removing the cause of the pyloric spasm and hypermotility of the pyloric end of the stomach. While these patients are symptomatically cured the ulcer frequently remains unaffected.

In a series of cases of ulcer of the duodenum studied at the University Hospital, 28 per cent had hypoacidity or anacidity. In the absence of obstruction this latter group will not be benefited by gastroenterostomy.

Ulcers of the duodenum and stomach do not give any direct symptoms. All the symptoms are secondary, that is, are due to pylorospasm and the secondary hypermotility of the pyloric end of the stomach. This explains the "silent" ulcer, in which these secondary reflex findings are absent. Under local anesthesia, the injections being limited entirely to the abdominal wall and exclusive of any splanchnic anesthesia, I have incised and cauterized both the stomach and duodenum without the patient experiencing the slightest pain.

In my personal work I am committed to the eradication of the ulcer whenever feasible, considering gastroenterostomy as being both unanatomical and unphysiological. I avoid its performance as much as possible. Surely, the eradication of the ulcer and anatomical restoration at the pylorus, so that the stomach empties into the duodenum as intended, is the ideal we should strive for. In the Horsley operation the same single incision is employed for the resection of the duodenal ulcer and the plastic restoration of the pylorus.

The trouble with gastroenterostomy is that it has been too good an operation, and "the good enough is the worst enemy of the best." This applies, in my opinion and experience, to a definitely limited group of cases which can be better treated by removal of the ulcer with or without pyloroplasty than by gastroenterostomy. There is no ques-

tion but that gastroenterostomy is a very beneficial operation but in many instances it is not the best.

In reviewing a hundred stomach cases which I personally operated upon, I find that of 53 ulcer cases, 21 simple gastroenterostomies were performed, with two operative deaths. Thirty-two resections of the ulcer were performed with two deaths; 13 of these had a pyloroplasty of the Horsley type. In the thirteen Horsley pyloroplasties there were no deaths. Some of the ulcer resections have been secondary to gastroenterostomies performed elsewhere.

In no field of surgery is the individualization of the case at hand more important than in ulcer of the stomach and duodenum.

DR. A. T. MANN (Minneapolis): Dr. Balfour's paper has been exceedingly clear and I for one cannot take exception to anything I find in that paper. I believe it presents to us the practice of the best surgeons of the present day. In other words, it seems to me the paper strikes the target. But it is a movable target and we must keep watching the target. We can expect in the years to come some slight modifications. I think it is possible that there may come some revolutionary modifications; but we cannot foresee them.

Now, in regard to the ulcers, the gastric ulcer and the duodenal ulcer are different. They are different in conditions which accompany them and the organ in which they occur. The duodenal ulcer is more often associated with hyperacidity than is the gastric ulcer. There is a chemical difference, a difference of function. That difference can be measured by the results of the test meals. The charts show that nearly 75 per cent of duodenal ulcers have hyperchlorhydria, and only about 20 per cent of gastric ulcers have hyperchlorhydria.

In regard to the partial resection of the stomach it seems to me that the position Dr. Balfour has taken is the right one. It seems unwise, unnecessary to sacrifice a portion of a normal stomach and remove part of the stomach when the ulcer is in the duodenum. My present feeling is that partial gastrectomy is done and should be done only in cases of ulcer of the stomach, very seldom as a secondary operation with the complications that come with ulcers in the duodenum after a previous operation has been performed. The resection of an ulcer in the stomach probably will give us better results if it is accompanied by a gastroenterostomy. Why that is, we have not been able to explain. Our position comes from a study of results, and there have been quite a number of the gastric ulcers which have been excised without gastroenterostomy in which a new gastric ulcer has formed in the stomach and required a gastroenterostomy later. So that from experience we feel that it is more necessary to do a gastroenterostomy after excision of a gastric ulcer than it is to do a gastroenterostomy after excision of an ulcer of the duodenum.

As to the excision of an ulcer of the duodenum without gastroenterostomy, it seems to me that this should be limited to the cases where the ulcer is comparatively moderate or small in size, and where the closure does not tend to constrict the duodenum or the outlet of the stomach; that is, where the ulcer can be excised and a full passage restored. Even when they are excised a gastroenterostomy should be performed as a rule.

The whole subject is very interesting and it is exceedingly interesting that after all these years we have rested again with so much feeling of security on a gastroenterostomy. It should not always be done but it is our mainstay and it has proven its worth. Many other things could be said, but I think that is enough.

DR. T. L. CHAPMAN (Duluth): It is stabilizing to a large part of the more active of surgeons at this time, to hear so reasonable a voice and one so able, urging conservative surgery in cases of peptic ulcer. The more radical of the German surgeons have so filled much of the late literature with appeal toward the more extravagant resections for comparatively benign lesions, that much doubt has been raised as to whether or not the simpler operations have any longer a position of dignity or security. The statistical value of Dr. Balfour's presentation is very great, and particularly so in relation to the treatment of duodenal ulcer in the large majority of cases by gastroenterostomy. There has been recently so much written and discussed of the shortcomings of this operation, that even experienced stomach surgeons may have felt a faltering in confidence in this, as a standard procedure. Undoubtedly there are various functional disturbances and some further surgical sequelæ as a result of this operation being so generally advocated; but the statistical basis of improvement and safety seems to point conclusively to the operation as excellent treatment, in a great majority of cases.

It is extremely important, it seems to me, that any surgeon undertaking gastro-enteric surgery, should possess himself of the available technique and sequelæ of a large number of types of operation. Individual variations of the disease are so very wide, and the personal equation of operative skill makes it imperative that a change from the usually applied operation be made with facility, if the situation seems to require it. A considerable repertoire of operative shifts must be available, therefore, in all branches of this type of surgery.

We are entirely in accord with the essayist's opinion that gross resections are not required in the usual type of duodenal ulcers. The principle of removal of gastric ulcers plus a gastroenterostomy is certainly correct, and resection of the pyloric portion of the stomach for very large, or for severe pyloric ulcer, has proved its value by the safety of the patient from recurrence, and his subsequent comfort. So much for the standard types encountered; nevertheless it seems to me that any given case may demand a variant from the usual operation, that will satisfy a peculiar necessity of the immediate or future situation of the patient. When a certain type of operation is thought to apply to the given case, actual operative findings at the table will often cause the necessity for applying a very different type of operation. It is knowledge and experience that makes this change of value to the patient and protects his surgeon from the fear that he may have done an ineffective or probably harmful operation.

What has been said regarding certain standard operations as applied to certain types of peptic ulcer is, of course, not unalterable. There are various complications of gastric and upper enteric disease that will entirely warrant the most elaborate and various of surgical resections and plasties, with entire justification. Emphasis is laid in this regard

upon the surgeon's knowledge of the technique of all the accredited types of operation, and his entire understanding of the probable effects in the manner of healing, the probable subsequent function of the affected parts, and the general safety to the patient. When these conditions are complied with, it is felt that proper selection of operative measures may be safely applied.

**THE CHAIRMAN (Dr. Hunt):** In throwing this paper open for general discussion I think that the principle of free speech should be encouraged. This is a subject of importance not only to the surgeon but to the internist as well. In extending the invitation to the internists I wish to call upon an internist I see here who has had wide experience in treatment of ulcer and has seen many of these patients before and after operation. I have not notified him beforehand but will now, and will call upon Dr. S. Marx White.

**DR. S. MARX WHITE (Minneapolis):** Thank you for the failure to notify me beforehand; that gives an opportunity to explain my shortcomings in the discussion. I have been extremely edified by the discussion which has been had here and I want to voice first my entire approval of the reaction which has appeared in those discussing the paper and was manifested in Dr. Balfour's presentation of the necessity for a careful selection of the type of operation to be applied. The case with which gastroenterostomy can be done, the mastering of its technic by a large number of surgeons, has, I feel, led to its application in probably a larger number of cases than it would be applied where the skillful surgeon is the master of all the technic necessary for the various procedures applicable in the individual case. The case in whom resection of the gastric ulcer can be done has too many times been subjected only to gastroenterostomy; and possibly also an attempt at gastric resection, resection of portions of the stomach, has been done where the skill was not sufficient for the application in that particular case.

As an internist, however, the portion of this subject that appeals to me most strongly is the necessity for careful medical treatment beforehand. Dr. Balfour has emphasized the need or the call in most cases for an attempt at medical cure and this certainly should be done because a considerable number of cases are possible of relief over a very long time and sometimes complete relief by medical measures. But more important, as I see it, is the application of medical measures following operation, the application during the period of convalescence of the proper methods of medical treatment and for a long time succeeding. Now, I can appreciate that the surgeon is anxious to demonstrate as effectively as possible the efficacy of the surgical measures, but I believe that when the interest of the patient is taken into account we will realize that we ought to add the application of those principles which we understand of the functions of the stomach for a long period of time at least after operation has been done. Every one of us believes that with the gastroenterostomy, we will say as an illustration, and more particularly with the application of more widespread surgical procedures on the stomach, it takes a long time, it takes many months before that stomach is again readjusted to the new conditions. During that period the patient should have every opportunity for the

best, the fullest, the most complete healing, and as complete physiologic rest and adaptation as can be provided; and the internist is in a position and should be called upon to supply that supervision.

**DR. C. M. ROAN (Minneapolis):** About six or seven years ago I had an experience which has made me hesitate at times since, as to surgery on the stomach. A man about fifty years of age consulted me and after a careful examination I diagnosed a gastric ulcer and affected appendix. This man subjected himself to operation, and upon opening him I felt that I had made a mistake in diagnosis. I found as mass as large as my fist in the lesser curvature which I, previous to the operation, had diagnosed as ulcer, but at that moment I felt certain it must be a malignancy. It was not a gumma. I took a look at his appendix. It was swollen, congested and badly inflamed, but I said to my assistant, "There is no use removing the appendix from a man who has only a short time to live on account of this carcinoma." I closed him up and told him later I could do very little for him. He was one of these very good patients who remain with his doctor. The only advice I could give him was to eat as little as possible. I do not know just why I gave him that advice. A year or so afterwards I was called to see him. He had a typical attack of acute appendicitis, very severe, and in view of the fact that the man had not lost weight I told him at that time what I had found at operation and that I must have been mistaken as it now seemed necessary to remove his appendix, which I did. At this time I made a high incision and was surprised not only to find the appendix inflamed but also that the mass in the lesser curvature had entirely disappeared. There had been no treatment given him other than starvation. The man is well today.

I want to relate another experience which bears on this topic of stomach surgery. I was called upon about two years ago to see a man who had had a gastroenterostomy performed by an able man. This patient suffered a great deal but particularly from a very bad odor which was like that of rotten eggs. He could not sleep in the same room with his wife on account of this odor. I didn't know what to do with him but finally I came to the conclusion that the best thing would be to detach the gastroenterostomy, which I advised him to have done and which he submitted himself to. I found—and that bears on the point Dr. Strachauer mentioned about gastroenterostomy, that while it is the mainstay it is one of the operations which have been very badly misused—I found that this man had the ilium within three or four inches from the cecum attached to the greater curvature of the stomach, and that the bad odor he had had was due directly from the big bowel. I detached the gastroenterostomy and the man was relieved of the odor, but peculiarly enough his old symptoms of a duodenal ulcer reappeared, and he has those typical symptoms today. I believe this man will have to have a real gastroenterostomy performed yet before he will get well.

**DR. D. C. BALFOUR (Rochester):** I think this discussion has brought out very clearly two things: that surgeons are more or less agreed as to the treatment of gastric ulcer and are not agreed as to the treatment of duodenal ulcer. That is, in gastric ulcer one recognizes that the lesion should be removed. The method of removal is not of great impor-



tance, although there is an increasing tendency toward partial gastrectomy and I have no doubt that it should be done in a large percentage of cases. When one considers duodenal ulcer, I think the difference of opinion is due to the fact that no one is satisfied with the results in these cases. If a careful selection of cases is made and one does the operation which is indicated, the results are excellent; but, as Doctor Mann has said, the whole question is a movable target because traditions are changing. The very spectacular results which gastro-enterostomy gave in the earlier days of gastric surgery are not so frequently seen now because we are getting quite a different group of patients since the public is spreading the news that the surgical treatment of ulcer is so effective. One may have patients with very mild symptoms and small lesions, and upon exploration find a small stomach. In such cases one cannot get perfect results, and at any event the results are not very definite because the symptoms were not very definite. I think it is in this group that medical treatment is highly advisable; and since the patient is not in a condition serious enough to warrant surgery, the treatment should be prolonged in order to give him every chance to get well.

I think Doctor White's discussion is one of the best that I have ever heard an internist give on this question. I believe that every surgeon would approve of what he said and would emphasize the importance of it.

When one considers the various operations which have been advised, there is one principle which I think should always be kept in mind: that is, to get good results one must have good drainage. No matter what procedure is contemplated in the individual ulcer, good drainage is essential. Once an operation is done on the pylorus or on the greater curve of the stomach, or what not, if one does not get good drainage, one does not get the relief of spasm in the stomach, nor does one secure the regurgitation in the outline of the duodenal loop which is so necessary to a good result in peptic ulcer.

#### PIXALBOL NOT ACCEPTED FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Pixalbol is the name under which E. Bilhuber, Inc., New York, markets a colorless tar preparation which is manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany. It is claimed to be identical with the preparation formerly sold in the United States by Knoll & Co. as Anthrasol. The trademark on the word "Anthrasol" was seized by the U. S. government during the late war and sold to the Chemical Foundation, Inc. The product may be marketed in the United States under the name Anthrasol, only with the consent of the holders of the rights to the trademark. In consideration of the abuses which are connected with the application of proprietary names to medicinal articles, the Council recognizes such names only when this is in the interest of the public welfare. Since the product in question was introduced under the name Anthrasol, the Council decided that it was not in the interest of medicine that further proprietary names be applied to it. The Council informed E. Bilhuber, Inc., that consideration will be given the product if it is marketed as Anthrasol under license from the Chemical Foundation, Inc., or under a satisfactory descriptive non-exclusive name. (*Journal A. M. A.*, Nov. 22, 1924, p. 1704.)

#### ACUTE PERFORATED GASTRIC AND DUODENAL ULCERS\*

P. E. STANGL, M.D., F.A.C.S.,  
St. Cloud, Minn.

Acute perforation of an ulcer of the stomach or duodenum is not an every-day occurrence; nevertheless it is frequent enough to demand our serious consideration. This is especially true because it is a curable condition and its cure depends on its early recognition.

During the past two years eight cases have come under our observation. This number includes only those in which there was no previous manifestation of perforation but in which there was a sudden perforation of an upper abdominal viscus and the contents suddenly poured into the upper peritoneal cavity. In our series of cases, one occurred shortly after breakfast, one in mid-afternoon, three at five in the afternoon, one in bed at ten o'clock at night, demonstrating that an ulcer of the duodenum or stomach may perforate at any time. All of our patients were comparatively healthy males ranging from seventeen to thirty-nine years of age. Two patients were brothers. Four of our patients had been on varied types of previous medical treatment and three were without previous symptoms.

Acute perforations with gross symptoms are, according to our experience, generally located on the anterior side of the stomach or duodenum or at a point easily accessible. If posteriorly located or in a position not easily accessible they are anatomically converted into a localized chronic adhesive perigastritis. We also believe that it is of little import in diagnosis or treatment whether these perforations occur in the stomach or duodenum. All of our cases were anterior perforations and four were in the stomach and four in the duodenum.

The diagnosis of perforation is not made by observing a large number of symptoms or signs but the few symptoms that are present are so striking and definite that a diagnosis in the beginning is not difficult. The two principal and outstanding symptoms are pain and rigidity, the former being evident to the patient, the latter to the examining physician.

The pain is characterized by its suddenness in

\*Read before the annual meeting of the Minnesota State Medical Association, St. Cloud, Oct. 8, 1924.



onset and its severity. It is so severe that the patient at once drops any activity in which he is engaged and holds himself in a cramped position fearful of increasing the pain by movement. The pain is continuous and most often not relieved by hypodermics of large doses of morphine.

The second symptom and that most evident to the examiner is rigidity. The abdomen is hard and board-like and retracted, with the margins of the recti muscles plainly visible. This rigidity is seldom released until deep anesthesia is complete. These two symptoms, the sudden excruciating pain in the epigastrium and the board-like rigidity of the abdomen, are in most cases diagnostic of perforation in the upper abdomen.

Vomiting is of little diagnostic value. Other signs, such as dullness, distention, etc., which usually appear late, are of no importance in the early diagnosis and when present are indicative of an extending peritonitis and a bad prognosis. The absence of elevation of pulse and temperature in the early hours is an important point, both in diagnosis and prognosis. When the patient is seen late the rise of pulse and temperature is again indicative of extending intraperitoneal infection and a bad prognosis.

The white blood count is very important to us in confirming diagnosis. Usually at the end of the first hour there is a rise of from two to four thousand above normal and a proportionate rise occurs each hour thereafter.

One case not included in the above series was brought to our office with almost typical perforative symptoms and only after an hourly blood count for five hours without an increase and a gradual release of his abdominal condition did we pass up operative investigation. In spite of the release of his symptoms a continued hourly increase in his white count would have brought him to the operating room.

Shock of varying degrees is present in all cases when seen early and as time continues without interference it is replaced by the evidence of an extending peritonitis.

The treatment of perforation is exclusively surgical and in general consists of excision of the ulcer perforation with a margin sufficient to render the edges pliable enough for suturing. If our observations at operation reveal obstruction to the outlet or a possibility of obstruction developing in the future, the usual posterior gastro-enterostomy is

performed in addition to the repair of the perforation. In four instances we performed gastro-enterostomy.

Our patients presented symptoms of shock at the time of operation and we believe that the surgery indicated, even to the repair of the perforation and gastro-enterostomy, is well borne. Six of our patients made a rapid post-operative recovery. We keep these patients on ulcer management for at least three months after leaving the hospital.

As to drainage, we believe, in patients promptly diagnosed and operated, drainage is not essential. However, in the later cases one may be guided by the amount of intraperitoneal infection.

In none of our patients with acutely perforated ulcers have we felt that the indications for radical resection of large parts of the stomach or duodenum justified the risk of this measure. We have felt that should resection be indicated at some future date our gastro-enterostomy already performed represents an accomplished part of the radical operation.

In the above series of operated cases, one was brought to the hospital and operated sixteen hours after the onset, with all the symptoms of generalized diffuse peritonitis. We felt that although operative investigation was of little avail, the patient might be benefited by closing the perforation and rendering what assistance could be given by drainage. He died eighteen hours after operation. One patient operated eight hours after onset with early manifestation of an extending intraperitoneal infection and upon whom a repair of the perforation and gastro-enterostomy was done, had a stormy convalescence for twenty-four hours immediately post-operative but reacted rapidly thereafter. All of the remaining cases were brought to operation within four hours of the onset.

From the above we might conclude that the success of operative investigation depends entirely on the extent to which the intra-peritoneal infection has advanced and that the safety zone lies somewhere between eight and sixteen hours after the perforation.

The following two records are those of two of the patients of the above series:

CASE No. 25427. E. S., male, aged 23, butcher by trade, taken suddenly at three in the afternoon with a pain in the abdomen that doubled him up. Examination reveals a healthy young male with retracted, board-like abdomen complaining of severe pain. Pulse 60, temperature 97, respiration 28. The skin was cold and moist. The white blood count was 19,000 at the end of one and one-half

hours. He had had a definite diagnosis of duodenal ulcer two years ago.

Under ether anesthesia two and one-half hours after onset, operation revealed a round perforated ulcer at the pylorus. There was little induration of ulcer margins. The opening was closed and a posterior gastro-enterostomy performed. Recovery was uneventful. Ulcer management was instituted for four months post-operative.

It is interesting to note that an acute suppurative appendix was removed nine months later.

CASE No. 26720. J. C., aged 17, male, student, while walking about at 4:30 in the afternoon, was taken suddenly and without previous warning with an acute pain in the upper abdomen which doubled him up so that he was carried home. Examination reveals a boy in acute pain. The skin was cold and moist. The abdomen was of a board-like hardness and retracted and the recti muscles were markedly rigid. Temperature 97.6, pulse, 80-100, respiration 26 and shallow. The white blood count at 6 p. m. was 12,600; at 7 p. m., 14,000.

Operation at 8 p. m., three and one-half hours after onset, revealed a perforation on the anterior wall of the stomach. Resection of the ulcer margin was made with proper closure of the defect. Recovery was rapid and uneventful. He was kept on an ulcer management for three months post-operative.

This patient had no previous history of gastric trouble.

#### DISCUSSION

DR. H. C. COONEY (Princeton, Minnesota): I wish to compliment Dr. Stangl on his short but excellent paper on this topic. Ulcer of the stomach is something like the poor, we have it always with us. The very important thing about the management of a perforated ulcer of the stomach is to "move our freight" while the moving is good, that is, get into the abdomen early, make a prompt diagnosis if possible, but get into the abdomen early, anyhow, before we have an obstructive and destructive peritonitis instituted, i. e., in ten or twelve hours.

There are three or four conditions that simulate perforation: acute inflammation of the pancreas, acute appendicitis, cholecystitis, intestinal obstruction and another lesser known condition, angina pectoris with abdominal symptoms accompanied with fever and elevated pulse. I have had one such case in which I deferred operation and thereby saved the patient's life. These patients do not have the board-like rigidity which is always present in perforated ulcer cases, unless it has been relaxed by morphin. These conditions simulating perforation of a gastric ulcer or duodenal ulcer, with the exception of abdominal angina, are all surgical. There is something characteristic and distinctive about the abdominal rigidity and agonizing pain (the pain is always agonizing) when perforation has taken place. This is not the colic of acute indigestion, or the colic of constipation.

When confronted by the clinical picture described, there are two things to beware of, as they are equally deadly in their ultimate effect, and they are the too liberal use of morphine hypodermics, or an inexperienced but sanguine medical consultant, who advises that you mark time "until tomorrow."

I have nothing dogmatic to say about the method of procedure that shall govern the surgeon when the laparotomy is made, whether a simple closure of the perforation be done, whether drainage shall be used or not, whether a posterior gastro-enterostomy shall be made; all this must be determined by the condition of the patient at the time of operation. If much soiling of the peritoneum is present, if the perforation is more than twelve hours old, I am going to drain that pelvis through a supra-pubic stab wound and a good sized, well placed tube and then keep the patient in Fowler's position for three or four days. If considerable peritonitis is present I am going to bring forward my pet surgical remedy for this condition; that is the establishment of an enterostomy in the upper jejunum by placing a soft rubber catheter *properly* into the lumen of the bowel through which *pints* of normal salt solution are instilled and intestinal drainage is established. This method I have carried out with great satisfaction in the treatment of diffuse peritonitis, from any cause, for the past six years.

THE CHAIRMAN: In the absence of Dr. C. H. Mayo, I am going to call upon Dr. W. J. Mayo to discuss the paper, please.

DR. W. J. MAYO (Rochester): I am called on to substitute for a fine man. I have been much interested in the cleancut exposition of Dr. Stangl, and the remarks made by Dr. Cooney I want to endorse. As Dr. Stangl says, in the diagnosis of acute perforation, the sudden attack of pain, the rigidity of the abdomen, and the rising leukocyte count are very important.

Why do so many patients with acute perforation come late to the surgeon? We know from general experience, and it certainly has been our own, that the patient who is operated on within eight hours after an acute perforation occurs, will probably get well. In patients operated on from twelve to twenty-four hours and more after perforation, the death rate goes up rapidly. In cases of acute perforation, delay in seeking early operation is often owing to what might be called the "fatal improvement," that is, the period following the primary effect of the perforation when the pain has been relieved by morphin, which misleads the attending physician into believing the trouble is a colic or temporary indigestion. The two important signs to which Dr. Stangl called attention, continuing rigidity of the abdomen and gradual increase in the leukocyte count, are so liable to be unobserved; in the presence of these two signs, apparent improvement should be disregarded, and operation performed at once.

Dr. Cooney spoke of enterostomy in the septic obstruction which appears with developing peritonitis and sometimes follows operation in the later stages. I am glad the question of this life-saving procedure has been brought up. In the treatment of the septic type of obstruction with reversed peristalsis, I know of nothing so valuable as a high jejunostomy, with two tubes, usually small catheters, one up to remove the toxic fluid intestinal contents regurgitated into the duodenum or stomach, and one down for the introduction of fluids, the salt solution with glucose of which Dr. Cooney spoke. In this way, an astonishing amount of fluid will often be removed from the intestine of the patient, with recovery. Within the last few months, Dr. Walters has operated in several cases of secondary sep-

tic peritonitis of this obstructive type, on patients apparently moribund, with recovery.

We should make a clear distinction between the acute perforating ulcers of the duodenum and those of the stomach. The duodenum does not always contain a large amount of fluid, and the fluid may be relatively sterile. In the duodenal perforations the contents are distributed by gravity about the cecum, sometimes leading to the diagnosis of acute appendicitis. Perforations of the stomach are very serious, because the stomach often contains a large amount of septic material which is distributed rapidly throughout the peritoneal cavity. In such cases, as Dr. Cooney said, it is usually wise to introduce a drainage tube through a suprapubic stab wound into the pelvis, set the patient up, and, if septic obstruction exists, do a jejunostomy in addition, inserting the jejunal tubes for the purpose of intestinal drainage and delivering fluids into the dehydrated patient.

DR. E. M. JONES (St. Paul, Minn.): I think a very important point, and one that has struck me very forcibly, is the slight degree of shock present in these cases during the first few hours. They have the rigid abdomen, the severe pain, but it is not uncommon to find them with a pulse of seventy to eighty, of very good volume. This is in marked contrast to the picture presented in acute pancreatitis. These cases are always in decided shock, with a characteristic thready pulse, and I think this is a very important differential point.

In regard to the white count, I, personally, do not feel that I would care to put much weight on the white blood count as a differential point in making a diagnosis when dealing with an acute abdomen, and especially when the question of an acute perforated ulcer presents itself. The crucial thing is to get in as soon as possible, and I would much prefer making an exploratory laparotomy rather than to wait for an increased white count to develop.

I believe that as little should be done as possible when dealing with an acute perforated ulcer. I never have felt that gastro-enterostomy was indicated unless there was a decided obstruction present. Many of these cases have been operated upon, the perforation closed, and they recover, and it has been shown that comparatively few of these ulcers that have perforated give further trouble. I think that is one strong point in favor of not doing a gastro-enterostomy unless we have a decided obstruction.

There is one thing that we have all seen and that has not been mentioned today as a very common complication following these cases of perforated ulcer, and that is a subphrenic abscess. After operation these cases may enjoy a very smooth convalescence, but ten days or two weeks later signs of infection may present themselves. In such cases we should always bear in mind the possibility of subphrenic abscess.

DR. VERNE C. HUNT (Rochester): One feature that has not been discussed is the time element at which operation may be undertaken. Some years ago Dr. W. J. Mayo called attention to the sequence of events that occurred after perforation of an upper abdominal viscus, and he described these in three stages: first, the stage of contamination; second, the stage of reaction; and third, the stage of pro-

gressive peritonitis. He called attention to the fact that perforations occurring in upper abdominal organs and operated on or explored within the stage of contamination, or the early part of the stage of reaction, had very excellent chance of recovery. He also emphasized the fact that patients who were operated on late, or during the stage of progressive peritonitis, practically always died.

This simply emphasizes the time element at which exploration may be accomplished or at which operation may be done with benefit to the patient, and bears out the observation that the longer the duration of the symptoms or the longer since the perforation until treatment is undertaken or the abdomen is opened, the poorer are the prospects of recovery. For those patients coming in the latter part of the stage of reaction or in the so-called stage of progressive peritonitis, some consolation may be obtained in the fact that perforations of the stomach, duodenum, or gall-bladder have a tendency to localize. Doctor Mayo, Doctor Deaver, and others have called attention to the perforations of the upper abdomen having this tendency toward localization. We know that as we see them at the operating table it is only a relatively small proportion of the gastric and duodenal ulcers which have a true perforation, that is, a free perforation in the upper abdominal cavity. Protective perforation often takes place posteriorly onto the pancreas or anteriorly onto the liver.

The majority of gastric ulcers as they are seen at the operating table may have been perforated but have had a protective perforation. When patients are seen late, from twenty-four to thirty-six hours after a so-called protective perforation may have occurred, it must be remembered that it is not necessarily a true perforation of the stomach; it may be a protective perforation with marked upper abdominal symptoms. I speak of this because there are times in which protective perforation does occur with pain and other symptoms simulating those of a true perforation, and the time interval is so great and condition of the patient so poor as to forbid operation, that under non-surgical management the patient usually recovers from the given attack.

The question of gastro-enterostomy is one regarding which there is a considerable difference of opinion. The question whether gastro-enterostomy should be performed at the time depends on the time interval between perforation and operation, and the condition of the patient, etc. I think it may be stated that the results that have been obtained by simple excision of gastric ulcers that have not perforated are not nearly as good as when simple excision is done with gastro-enterostomy. I think the same may be applied to gastric ulcers that have perforated. Experience has shown that many patients who have had simple closure of perforated gastric ulcer have required subsequent gastro-enterostomy. These results that have often occurred following closure of the perforation are due to the disturbance of motility. The better results occurring after gastro-enterostomy and simple excision are due to the fact that the disturbance of motility has been overcome by the gastro-enterostomy.

The mortality rate of surgical treatment of perforated gastric ulcer is directly dependent upon the time interval between perforation and operation, as to whether operation

is undertaken early in the stage of contamination or late in the stage of progressive peritonitis. As to whether simple closure or closure with gastro-enterostomy is made, all else being equal, the mortality rate is little affected. However, the subsequent functional result will be better with the latter procedure than with simple closure of the perforation.

DR. A. M. RIDGWAY (Annandale, Minn.): One thing that has been brought out by the different discussionists is in regard to pain. I do not think enough stress has been laid on pain. I, unfortunately, have had several of these cases. As soon as perforation occurs, the patient usually falls and is unable to walk or move. He has to be picked up and carried. The one who operates usually sees him several hours after the perforation has occurred, and they have been pretty well under the influence of morphine. The pain is excruciating at first and there is nothing else that produces the board-like rigidity of the upper abdominal muscles in my experience. I have never seen vomiting following perforation of the stomach or duodenum. Several of these cases of perforation have had no previous history of stomach trouble or pain. I mention these more for the younger men who have not seen many of these cases.

To illustrate: Mr. B., twenty-four years of age, a bus driver, no previous history of stomach trouble, drove from one to two hundred miles a day and had been for some time eating quite irregularly, and feeling fine. When this perforation occurred he had just finished a hearty dinner and was washing his bus when he was seized with the most excruciating pain and was unable to move and fell. He was picked up, carried to his home, but was not operated on until the following day. He made a nice uninterrupted recovery.

The second case: A young farmer, thirty years of age, had never had any stomach symptoms until the perforation occurred, which took place shortly after a hearty supper. He started out to walk about one mile to a country store but had only gone a short distance when he was taken with the most agonizing and excruciating pain and fell in the road. He had a flashlight with him which was observed by a neighbor woman. She, thinking it was some children playing, went to investigate and found this man sitting on the ground moaning with pain and in profound shock. I was called and gave him one-half grain of morphine hypodermically, also inhalation of chloroform, which relieved him sufficiently so that he could be removed to his home. He was operated the next morning. The perforation was at the posterior part of the stomach and about one inch in length. He made an uninterrupted recovery.

DR. L. SOGGE (Windom, Minn.): I just want to mention one case that I had a couple of years ago. This man had a gastro-enterostomy at the Mayo clinic about three years before this and it was working perfectly at this time. When I saw him he had a complete perforation of the upper anterior wall of the stomach large enough so one could introduce the little finger through that opening. How do you explain the necessity of doing a gastro-enterostomy at the time that you repair the opening in the stomach?

DR. W. H. MAGIE (Duluth): This paper, including the discussion of perforative ulcer of duodenum and the possi-

bility of traumatism causing ulcer, brings to my mind a case that came under my care about twenty years ago. This case gave a history of an injury caused by attempting to board a steamer as it was leaving the dock. When the steamer was about five feet away from the dock the patient jumped to the steamer in an attempt to board the boat. He missed his footing and fell, striking his epigastrium on the edge of the deck at the gangway, catching his pylorus between the deck of the boat and his spinal column. He was a slender man. He immediately became nauseated and vomited blood. He, as a result of this injury, contracted an ulcer. Some seven years later he came into my hands for treatment. At the operation I found an enormously dilated stomach with complete obstruction of the pyloric outlet. Gastro-enterostomy was performed on the posterior wall with a Murphy button and he gained twenty-one pounds in twenty-one days while in the hospital. This proves, without doubt, that trauma can cause ulcer of the stomach or duodenum.

The most important lesson we are learning here today from this paper and the discussion thereof is that these cases of chronic ulcer of the stomach and duodenum should be diagnosed before perforation takes place and operation done. Many of my cases have undergone treatment by the so-called Sippy treatment by Sippy personally as well as myself and other physicians. In my experience and from knowledge gained by other sources, Sippy, or anyone else, has never cured a chronic ulcer of the stomach or duodenum. Sippy treatment has cured a lot of cases of sour stomach but never chronic ulcer. These chronic ulcers get temporarily better under most any form of treatment when their diet is regulated, but they always recur.

The lesson, as I have stated before, that we learn here today or at least ought to learn is early diagnosis of chronic ulcer and early operation and at a time when there is no danger to the patient by operation, at the same time make up our minds to discard the Sippy humbug.

A few years ago a very dear friend of mine developed an ulcer of the duodenum or stomach. He was treated in Chicago for weeks and in one instance for months by Dr. Sippy personally, each time with improvement and each time pronounced cured. Afterwards he was treated by what I call an over-night specialist in Duluth, who graduated under Dr. Sippy one day and became or at least advertised himself as a Sippy assistant and a specialist in stomach disease the next day. About four years ago I met my friend at the club and the discussion of his case came up. I then made the statement to him that Sippy treatment never did cure a chronic ulcer of the stomach or duodenum and warned him about the dangers of relying on the so-called Sippy treatment. This man was in the habit of spending his winters in California. I stated to him that he took great chances in refusing operation and that his ulcer was liable to perforate and maybe while he was in California and not having faith in surgery, he would delay operation until too late and probably fall into the hands of some incompetent surgeon, who would operate and he would probably lose his life. This very thing happened last spring. He had a perforation, was operated and died. I don't know who his surgeon was but have heard the operation was a late one.



This is what is happening to a lot of people who are suffering with chronic ulcer and will continue to happen with a whole lot of people who continue to monkey with this humbug known as the Sippy method.

DR. B. F. VAN VALKENBURG (Long Prairie): It seems to me that the question before the house is not the treatment of perforated ulcer. We admit that the proper treatment for that is undoubtedly operative, but the purpose of this paper, as I understand it, is to call the attention of the physicians to the early diagnosis and treatment of perforated gastric ulcer. Now I haven't had very many myself. I have had two or three, and one of them a fatal one. I really think that the points we should discuss and bring to the attention of the physicians of the state are the symptoms that go with a silent ulcer, perforated. These are the cases that I have been so thoroughly disappointed in so that I am glad to be here to hear what is to be said regarding this question.

I don't think we have anything in surgery or in the abdominal cavity that calls for immediate attention more than a perforated gastric ulcer. It is only a short time ago that I had a case that came to my attention at ten o'clock at night, and I failed to operate until the next morning, and it proved fatal. The idea in my mind is this: Let us find what are the most alarming symptoms of this very dreaded trouble. This case that I have reference to I found out in the country about eight or ten miles with the history that he had never had any stomach symptoms previously. He could eat anything and he had nothing to indicate that he had an ulcer. Now those are the alarming features that we meet in the country and undoubtedly you will find them in the city also, and those are the cases that we should have as typical cases to make our diagnosis and have certain symptoms to go by to make a diagnosis.

We have a whole lot in the abdominal cavity and we have a good many things there that can cause pain, but I do not believe, so far as my experience of thirty-one years of practice goes, that there is anything that gives you that characteristic pain of the abdominal cavity that a perforated gastric ulcer will give. It is the most striking pain that can come up in the abdominal cavity, as far as my experience is concerned. I haven't seen hundreds of them or dozens of them, but I have seen three or four that were very striking cases, and out of the four that I have seen and had under my care there has been only one of them that has given me a history that they had anything to do with stomach disturbance. So when we have these cases come up before us as silent ulcers, perforated, they are alarming; they are cases that need immediate attention;

and if they don't get it, my experience has been that they go to the grave.

As a general practitioner who does surgery when it comes to him, what are the symptoms that one should have before him and never forget in the treatment of these ulcers? There is a rigidity of the abdominal muscles that is not comparable to other diseases, and there is no temperature. There is an absence of the symptoms of suppuration and still the patient is in extreme pain. One-half grain of morphin will not quiet him, and I would like to ask the doctors here today if there is any other disease, any other pain in the abdominal cavity, that will not be relieved by a grain of morphin. I would like to call your attention to one fact: that you have a pain in the upper abdominal cavity that is equalled by no other malady in severity.

DR. P. E. STANGL (closing): Several points were brought up in the discussion and I will try to answer most of them.

The question of compensation under the state compensation act brings to mind one of the above cases. He was struck on the abdomen early in the morning and suffered a perforation. The case was denied before the Minnesota State Labor Commission.

As to differential diagnosis I think there are very few conditions with which this might be confounded and in all of our cases a direct diagnosis without question was made immediately.

Dr. Mayo spoke of duodenal ulcer not producing as active a symptom complex as gastric ulcer. Such has not been our experience and we believe that the location of the stomach in relation to the anterior abdominal wall and the fact that the perforations take place on the anterior wall of the stomach as compared with the location of the duodenum makes it possible for the opening in the stomach to come into more direct contact with the natural protection of the abdominal wall as compared with the duodenum, and this fact, we believe, is the reason for the occasional quieting of symptoms about two hours after a gastric perforation.

The white blood-count is not diagnostic in itself but is the one confirming part of the diagnosis.

In answering Dr. Cooney we believe that if such an amount of general peritonitis exists as to call for more treatment than simple drainage, the case has gone beyond the point where surgical measures are of avail.

Considerable discussion as to the early diagnosis of ulcers is rather out of the scope of this paper and it is our intention to consider ulcers already perforated as we see them and disregarding any previous gastric disturbance.

#### COLON BACILLUS VACCINE, GONOCOCCUS SERUM AND GONOCOCCUS VACCINE OMITTED FROM N. N. R.

The Council on Pharmacy and Chemistry reports that all colon bacillus vaccines, gonococcus serums and gonococcus vaccines have been omitted from New and Non-official Remedies. The Council took this action because an examination of the existing evidence goes to show that these preparations are not of therapeutic value. (*Jour. A. M. A., Jan. 17, 1925, p. 220.*)

#### EUCAIN

Originally, two kinds of "eucain" were on the market, namely, "alpha eucain" and "beta eucain." The use of the first product has been generally abandoned. The second product is official in the U. S. Pharmacopeia in the form of hydrochlorid (betaeucain hydrochlorid). Betaeucain hydrochlorid is a local anesthetic like cocain, but weaker and devoid of the stimulating properties of the latter. It does not dilate the pupil, nor does it contract the blood vessels as does cocain. (*Jour. A. M. A., Feb. 28, 1925, p. 698.*)

## THE PROGRESS OF CARDIOLOGY DURING 1924: A REVIEW OF THE WORKS OF CLINICIANS AND INVESTIGATORS IN THE UNITED STATES

FREDRICK A. WILLIUS, M.D.

Section on Cardiology, Mayo Clinic

Rochester, Minnesota

(Continued from page 170, March issue)

### VI. BLOOD PRESSURE

In a study of arteriosclerosis in relation to hypertension, O'Hare and Walker concluded that the peripheral vessels play little or no part in hypertension, but that a definite relationship exists between sclerosis of the small vessels, the retinal arteries, and high blood pressure. The ophthalmoscope may fail to reveal arteriosclerotic changes while the microscope reveals vascular changes in the retina. There may be choroidal arteriosclerosis without retinal arteriosclerosis. These authors believe that involvement of the small vessels undoubtedly is quite generalized.

Moschcowitz believes that evidence exists that a congenital peripheral resistance, either in the form of congenital stenosis of the isthmus of the aorta, or of a congenitally narrow aorta, may be the cause of hypertension, arteriosclerosis, and nephritis. It would be necessary to prove this hypothesis by careful clinical and necropsy correlation of a representative group of cases before its acceptance would be justified.

To determine the rôle that infections play in hypertension, Walker and O'Hare made a study of the comparative incidence of previous infections in 400 unselected hospital patients with normal blood pressure, and 400 with hypertension. The relative incidence of the various infections in the histories of these patients did not indicate that infections play a very important part in the causation of hypertension.

O'Hare, Walker and Vickers investigated the influence of heredity of hypertension. The two main conclusions from their observations are: (1) that heredity plays one of the most important rôles in the production of hypertensive disease; and (2) that Nature very often gives warning as early as the second decade of life of the possible development of hypertension in the fourth or fifth decade. They urge that the younger members of

these "vascular" families be protected against the strains that play such an important part in the production of hypertension.

The relation of blood pressure to the amount of renal tissue was studied experimentally by Anderson. The gradual rise in blood pressure in chronic glomerulonephritis, usually observed as the disease progresses, has been attributed by some observers to progressive atrophy of renal tissue. Anderson found that the removal or destruction of about 70 per cent of the renal tissue in rabbits did not produce hypertension, even when prolonged renal insufficiency resulted.

Performing similar experiments, Cash obtained different results. Reduction of renal tissue by excision and also by ligation of renal vessels was followed, under certain conditions and in most of the cases studied, by a rise of both systolic and diastolic blood pressure, averaging about 27 mm. of mercury. This change occurred when there was a reduction of total renal substance to at least 50 per cent, and when a portion of the kidney which had been deprived of its circulation was allowed to remain in situ. Extensive necrosis of renal tissue alone, such as occurs in widespread infarction of one kidney, or ligation of one branch of a renal artery, was not sufficient to cause any rise in blood pressure. Complete excision of one kidney likewise produced no elevation in blood pressure. The increase in blood pressure reaches its height a few days after completion of the operative procedures, after which it tends to return to normal. The rapidity with which this change occurs seemed to be roughly proportional to the amount of functioning renal tissue remaining. After the reduction of the total renal substance, varying from 25 to 85 per cent, no appreciable change occurred in the amount of nonprotein nitrogen or total chlorids of the blood. When the reduction exceeded 50 per cent there was always a retention of phenolsulphonephthalein. No constant changes occurred in the volume of the circulating blood, and edema was not produced during the course of these experiments.

Major and Stephenson, in their studies with the guanidin bases (methyl guanidin, sulphate, nitrate, dimethyl guanidin sulphate, guanidin carbonate, guanidin thiocyanate and guanidin hydrochlorid), found that they had a powerful pressor effect, raising blood pressure, and maintaining it at a high level. This was accompanied by a decrease in the

pulse and respiratory rate. The rise in blood pressure produced by these substances may be abolished promptly by the use of calcium chlorid, either alone or combined with potassium chlorid.

The relation of age to the size of the heart with special reference to the influence of hypertension has been studied by Bell and Hartzell. They concluded that the increase in the average size of the heart, after the fourth decade of life, is largely due to the influences of hypertension, and between the third and fourth decades, to increased body weight.

In a study of 100 cases of hypertension in which the heart was investigated, O'Hare and Walker found the average age to be fifty-five years. The blood pressure ranged from 152 systolic and 76 diastolic, to 290 systolic and 170 diastolic. In 28 per cent, the diagnosis of chronic myocarditis was made while cardiac symptoms were noted in a much larger number. Dyspnea was the most common symptom, occurring in 60 per cent. Cheyne-Stokes breathing was often a terminal event. Another type of dyspnea, paroxysmal nocturnal smothering, occurred in thirteen patients. This symptom had no definite relation to the height of the blood pressure, being associated with pressures as low as 160 systolic and 95 diastolic, but much more often with high diastolic pressures. Paroxysmal dyspnea occurred in only one patient who had precordial pain. Cardiac pain was usually present as a dull ache in the region of the apex and lower precordia. Typical angina pectoris occurred in only three cases. Edema of the lower extremities was present in 29 per cent of the cases. There was no instance of acute pulmonary edema. Cardiac hypertrophy was noted in 83 per cent. Thirty of fifty electrocardiograms showed preponderance of the left ventricle; twenty-nine showed no unbalance; and one showed questionable preponderance of the right ventricle.

Miller, in discussing a blood pressure paradox, has called attention to the fact that in certain blood-pressure examinations, the fourth phase may extend down to the zero point, resulting in the entire absence of the fifth phase. Therefore, those observers who rely on the fifth phase apparently find the diastolic pressure at zero, and are mystified. He emphasizes the importance of recording the diastolic pressure at the beginning of the fourth rather than at the fifth phase. This blood pressure paradox occurs at times with hyperthyroidism,

aortic regurgitation, fracture of the skull, or during general anesthesia.

In studying the blood pressure of the new-born, Rucker and Connell found the mean systolic pressure at birth to be 55 mm., and the mean diastolic pressure to be 40. The systolic pressure increased with age more rapidly than did the diastolic. Toxic states of the mother seemed to influence the blood pressure of the child, and markedly on the first day of life. They found that the blood pressure in general varied directly with the total length of the infant.

Mussey and Randall, in reviewing the records of 523 pregnant women, found that 104 of them sometime during pregnancy had had a systolic blood pressure of 140 or more. This observation is regarded as being a fair index of the onset of toxemia. Of the patients with elevated blood pressure readings less than thirty years of age, 72 per cent had toxemia, while 54 per cent of those with elevated blood pressure readings more than thirty years of age had toxemia.

A study of arterial hypotension, made by Levison, includes patients having blood pressures below 100, but exclusive of such diseases as tuberculosis, anemia, cachexia, acute infection, and adrenal disease. The symptoms elicited from the patients were so diverse and variable that it was impossible to construct a characteristic syndrome. The most constant symptoms were exhaustion, inability to engage in prolonged or constant mental or physical work, restlessness, headache, listlessness or apathy, and digestive disturbances. Levison found that the vital capacity and the renal functional tests in these uncomplicated cases did not vary materially from the normal.

#### VII. ARTERIES

Boas, in studying clinical "capillary pulsations" concludes that the clinical capillary pulse, as visualized on the lips, forehead, and the finger over the root of the nail, is chiefly a phenomenon of the subcapillary and cutaneous vascular plexuses, and not of the capillaries of the papillae of the skin and mucous membranes.

In reviewing arterial aneurysms at the Cincinnati General Hospital during a period of six years, Benjamin and Wiedemer found sixty-one cases, or an incidence of 0.6 per cent. Fifty-three of these involved the thoracic aorta and twenty-seven the arch. Pain in and about the chest (twenty-nine cases), cough (twenty-five cases), and dyspnea

(twenty-four cases) were the chief symptoms. Other symptoms were hemoptysis (five cases), dysphagia (four cases), and aphonia (seven cases). Albumin and granular casts were present in nineteen cases. The Wassermann reaction was positive in 66 per cent, and doubtful in 23 per cent. Eighteen patients improved under treatment and thirty-seven died. These authors maintain that potassium iodid is the drug of choice in the treatment of such cases.

Mayers reported two cases of aortic aneurysm which ruptured into the superior vena cava. He found that forty-five cases had been reported previously. Kahn reported an interesting and unusual case of a pulsating abscess of the chest wall which simulated aneurysm.

Howard in a discussion on syphilis of the heart and blood vessels calls attention to the fact that a great advance has been made in the recognition of syphilitic cardiovascular disease. He believes that adequate treatment will increase the comfort and the life expectancy of these patients.

Ridge, in his experience with cardiovascular syphilis, found that the most constant early symptom was neuralgic pains in the neck, extending upward toward the occiput and along the carotids, and sometimes radiating to the left shoulder. The next most constant symptom was a persistent fullness in the epigastrium, extreme on slight exertion. He believes that angina pectoris is a precursor of death. The prognosis in cardiovascular syphilis is very grave, and treatment for syphilis is of little value.

In a study of 140 patients with syphilitic disease of the aorta, Willius and Barnes divided the cases into three groups representing three stages, according to the degree of apparent damage. In the early stage there were thirteen cases, ten males and three females. The characteristic objective findings of aortic disease were absent. The authors emphasize the importance of the peculiar tambour-like accentuation of the aortic second tone, probably due to a loss of elasticity or resilience of the aorta as the result of syphilitic periaortitis. This was first described by Potain. Three of the patients had no cardiovascular symptoms, five had mild dyspnea, and two had angina pectoris. The Wassermann reactions were positive in nine cases, and negative in one. There was no cardiac mortality in this group. In the moderately advanced stage, there were thirty patients, nineteen males and

eleven females. The chief objective finding was a rough and reverberant systolic murmur localized to the aortic area and frequently transmitted into the carotids. Six patients had no cardiovascular complaints, thirteen had varying degrees of dyspnea, palpitation and other symptoms of cardiac inefficiency, and eleven had angina pectoris. The Wassermann reactions of fifteen patients were strongly positive, of twelve, negative, and of three, not recorded. Two patients died of heart disease, an average of fifteen months after examination. In the advanced stage there were 100 cases, eighty-eight males and twelve females. The syphilitic aortitis had progressed to the development of aortic regurgitation in this group. Aneurysm was not included due to lack of space. All the patients had symptoms referable to the cardiovascular system. The Wassermann reactions were strongly positive in seventy-two cases, negative in twenty-five, and not recorded in three. Thirty-one patients died from heart disease, an average of fourteen months after examination.

#### VIII. CONGENITAL HEART DISEASE

Every report of an unusual case of congenital heart disease is in itself an important contribution to the knowledge of cardiology.

The case of an adult is recorded by Canavan in which a deficient pericardium existed. No pericardium was visible except a triangular-shaped flap, which blended with the epicardium over the right side of the heart, and was attached at the apex, and near the origin of the great vessels. The posterior surface of the heart was entirely devoid of pericardium. The action of the heart was never attended by any known clinical irregularity. According to Maude Abbott, this defect in the pericardium may be accounted for by a too early atrophy of the left duct of Cuvier, owing to some anomaly of the circulation of the great venous trunks, the arrested development of the pulmonary ridge resulting in a localized defect of the pleuro-pericardial foramen, or owing to a more or less complete absence of the pleuropericardial septum.

Cosgrove and St. George report a case of ectopia cordis, fortunately a rare anomaly.

An unusual admixture of congenital defects is reported by Connally, in which a congenital stenosis of the mitral valve was combined with hypoplasia of the left auricle and ventricle, and the aorta was rudimentary.



Moench describes a case of aneurysmal dilatation of the pulmonary artery associated with patency of the ductus arteriosus (Botalli). Death occurred from rupture into the pericardial sac.

A case of congenital complete heart-block is described by Romberg and White.

#### IX. SIZE OF THE HEART

Fossier believes that percussion is of greater value than the x-ray in determining the size of the heart. Comparison between a person's heart and fist is the only practical determinant of the size of the normal heart. The linear dimension of the transverse diameter of the heart corresponds to a line drawn from the juncture of the inner side of the right hand and wrist, and ending at the middle joint of the fourth finger. This method of determining the size of the normal heart, while unique, is obviously open to many objections.

Transitory alterations of cardiac size and blood pressure have been observed by Eyster and Middleton with hemorrhage and blood transfusion in man in quantities within 1 per cent of the body weight. Compensatory agents cause a rapid readjustment to normal circulatory conditions, notwithstanding the altered blood volume.

Gordon and Wells found that inhalations of amyl-nitrite temporarily diminished the size of the heart of the cat, associated with a fall in blood pressure. Epinephrin during its vasoconstricting effect caused a transient increase in heart size with a rise in blood pressure.

#### X. CARDIAC RESPONSE TO EXERCISE

Propst's observations have led him to conclude that the so-called blood-pressure response to exercise in organic heart disease is of little prognostic value. In his series only 3 per cent of cases with organic heart disease gave positive reactions. Propst believes that the changes in blood pressure are due to vasomotor rather than to myocardial changes.

Ten children with chronic heart disease, said to have slightly diminished tolerance to exercise, were examined by Wallace, who found that they performed the activities of normal children easily and without evident physical detriment. These children were able to climb stairs rather swiftly without signs of cardiac embarrassment. The changes in blood-pressure reaction after a given degree of effort in children with mild heart disease were usually slightly longer than in children with nor-

mal hearts, and were still longer in children with severely damaged hearts, especially if mitral stenosis was present.

In a study of the heart affected by auricular fibrillation under exercise, Blumgart found that a disproportionate rise in ventricular rate occurred, followed by a delayed return to the previous resting level, as compared to the reaction of a normal heart. This is not due to the abnormal mechanism, as the same observation holds after a regular rhythm has been established. Digitalis in ordinary therapeutic doses does not protect the ventricles from the exaggerated response to exercise. As the ventricular rate rose, the auricular rate usually fell.

#### XI. TREATMENT

The committee appointed by the Council on Pharmacy and Chemistry, comprising Robinson, White, Eggleston, and Hatcher, have outlined the limitations of digitalis treatment and the methods of obtaining effects from it. They call attention to the danger of administering digitalis in cases of partial heart-block, and particularly of administering it intravenously as an emergency measure in cases of acute heart failure when a careful study of the heart has not been made. In auricular fibrillation digitalis is definitely indicated, and in any case oral, rather than intravenous or intramuscular, administration is the method of choice. Digitalis may slow the ventricular action in cases of auricular flutter, and tend to increase the efficiency of the heart. In certain cases digitalis may cause extrasystoles to disappear, and if the drug has not been given, their presence is not a contraindication to its use. In complete heart-block the effect of digitalis on the conduction system may be disregarded. Digitalis, however, should not be given in cases of temporary block when return to normal mechanism is anticipated. Patients with chronic myocarditis with signs of heart failure and normal rhythm will often be greatly improved by digitalis, but such patients are often unusually susceptible to the toxic effects of the drug, and it should be administered only by mouth. Less benefit should be expected from digitalis in cases of aortic regurgitation, although valvular lesions do not alter its indications. It is only in the exceptional case, in which digitalis action is urgent and should be obtained in two hours or less, that its intravenous or intramuscular administration is justified. In cases in which nausea or vomiting contraindicates the oral administration of the drug, therapeutic effect may be ob-

tained by its rectal administration. The total average dose of a fairly active standardized digitalis by mouth for inducing full therapeutic effects within thirty-six to forty-eight hours in an adult who has not received digitalis within ten days, is about 1.5 gm. of the leaf, or 15 c.c. of the tincture. This may be given in divided doses every four or six hours, or half of the total dose may be given at one time and the remaining half in two divided doses after four to six-hour intervals. If there is doubt concerning recent medication, smaller doses of from 0.1 to 0.3 gm. of the leaf, or from 1 to 3 c.c. of the tincture, should be given three or four times daily.

Luten found favorable effects from the drug a short time after the administration of massive doses to patients with normal mechanism. The total dose was estimated by the Eggleston method for an average tincture, and an amount somewhat smaller was chosen. The signs of improvement were diuresis, loss of edema, and a decrease in the size of the liver without a constant change in the ventricular rate. He attributes the improvement to increased myocardial efficiency by direct action on the muscle. Under proper administration of digitalis the patients with normal mechanism improved comparably to those with auricular fibrillation.

Levy reported favorable results following the rectal administration of "digitan." One cubic centimeter of this preparation is equivalent to 0.1 gm. of the powdered leaf, and 8 to 20 c.c. of digitan in 25 c.c. of water were given by rectum. Slowing of the ventricular rate was obtained on an average of two hours and thirty-five minutes after administration, and the effect was maximal after nine hours and thirty minutes. T-wave negativity in the electrocardiogram was observed after an average interval of two hours and thirty minutes, almost coincidental with ventricular slowing.

The results of Willius were similar to those of Levy. The studies are based on the use of the Minnesota-grown leaf, prepared as a standard tincture. In most cases one rectal instillation of 6 c.c. of the tincture in 100 c.c. of normal salt solution was given, and repeated daily until the desired degree of digitalization was obtained. In a smaller group of cases three daily rectal instillations of 2 to 2.5 c.c. of the tincture in 60 c.c. of normal salt solution were given. By giving the large dosage, a distinct effect was obtained within one or two

days, while with smaller doses three to five days were required to obtain the same results. No untoward effects have been encountered, either from the drug or from rectal intolerance. This method of administering digitalis is indicated in cases in which the drug cannot be given by mouth as in cases immediately after operations on the stomach, in cases of acute gastro-intestinal crisis of exophthalmic goiter, in cases of vomiting due to splanchnic congestion, and in certain cases of incomplete digitalization.

In commenting on the accuracy of the cat method for the assay of digitalis, Haskell and Courtney re-emphasize the fact that one or two cats are inadequate to determine accurately the strength of a digitalis preparation. They insist that the procedure must be carried out on a large number of cats.

Reid has observed five cases in which ectopic ventricular tachycardia appeared during the treatment of auricular fibrillation by digitalis. The amount of the drug administered before the onset of this disorder was well in excess of that indicated by the Eggleston method of calculation.

A very interesting comparative study of digifolin administration is reported by Clarke. Five ampules of digifolin (0.5 gm. of standardized digitalis leaf) were administered at twelve-hour intervals. An average slowing of the heart rate was noted in from three to four hours after intravenous injection, in four hours after intramuscular injection, and in six hours after oral administration. The amount of digifolin which shows the earliest and full therapeutic effect is about the same for the intravenous and the intramuscular methods of administration. About one-half again as much is required by mouth. Clarke reports two deaths which were apparently due to digifolin. The cost of digitalization is between \$2.50 to \$4.00 for each patient.

Pardee, in summing up his conclusions on the use of quinidin in heart disease, emphasizes particularly that the drug should not be used in cases of severe heart failure. It tends to increase the cardiac failure, and if normal rhythm is not quickly restored, irreparable harm may be done. The danger of embolism is greater with severe failure. He advocates the use of digitalis first in any type of heart disease, and then if auricular fibrillation persists, quinidin may be tried. This drug is beneficial in cases of extrasystolic arrhythmia. To re-emphasize the potential dangers of treatment by

quinidin, Wyckoff and Ginsberg report two cases of sudden death following its use. Quinidin sulphate was used by Musser in a group of patients having premature contractions. In no instances were bad results noted, and in 60 per cent of the cases very good results were obtained. In the majority of cases the premature beats disappeared, or the frequency and number of premature beats distinctly subsided.

Wedd studied the action of various drugs in clinical flutter. He believes that the action of digitalis, atropin and quinidin in cases of flutter is consistent with the theory of a circus movement. The changes produced by digitalis are variable, the reaction being a complex one depending on the dual action of the drug. Atropin may cause a fall or rise of auricular rate, while the ventricle tends to respond at a half rhythm. Quinidin produces a fall of auricular rate; the ventricular rate may rise or fall depending on its original rate, but tends to maintain a 2:1 rhythm. Wedd suggests that in the treatment of auricular flutter the production of auricular fibrillation should be avoided if possible, and by the combined use of digitalis and quinidin, or by following digitalis with quinidin, this may be effected by breaking up the circus movement by raising the refractory period of the muscle.

A study of camphor-in-oil in relation to cardiac stimulation led Marvin and Soifer to conclude that camphor has no demonstrable action on the circulation in congestive heart failure, and therefore no rational place in the treatment of that condition.

Mendenhall and Camp found that acetylsalicylic acid has a stimulating effect on the heart muscle, which is evidenced by a lowering of the threshold on electrical stimulation. The effect of this acid is directly on the heart muscle, and not due to paralysis or inhibition of the vagus mechanism. The drug is depressant to the heart muscle only in concentrations much higher than are likely to occur even in enormous doses.

I advocate the use of desiccated thyroid extract or thyroxin in cases of complete heart-block with Stokes-Adams attacks, if there are no evidences of heart failure. The dosage of thyroid is best determined by careful and repeated estimations of the basal metabolic rate, and it is important to maintain normal rates. I have discussed in detail the probable underlying principles of the cardio-

vascular dynamics of the beneficial effects of thyroid in this condition.

Neuhof describes his experience with novasurol, a German preparation, prepared in ampules of 1.2 c.c. It is a double salt of oxymercurichlorophenoxy sodium acetate and diethylmalonylurate. It is a water-soluble preparation containing about 33 per cent of mercury. He advocates its use in the edemas of cardionephritis that have been refractory to the usual methods of treatment. The drug may be given intramuscularly in doses of 1.2 c.c. daily for one to three days. Its use is contra-indicated in acute glomerulonephritis and enteritis.

## XII. SURGICAL PROCEDURES

Since Jonnesco's report of a case of sympathectomy for angina pectoris, a wave of enthusiasm has swept this country, and undoubtedly many operations have been performed when the indications were questionable. It is fitting in this connection to set forth the views on this subject of the great clinician, Sir James Mackenzie. "The impression has got abroad that the feats of the surgeon are indications of the progress of medicine. When an operation is carried out with a full knowledge of the morbid conditions which it is intended to relieve, and with a knowledge of the functions of the structures which the surgeon cuts in his operation, there might be some reason for regarding such surgery as an example of the progress of medicine; but when the surgeon is profoundly ignorant of the morbid condition for which he operates, and of the functions of the structures which he mutilates, it is impossible to conceive anything more detrimental to progress. At one time the surgeon was supposed to have a knowledge which would enable him to make not only a diagnosis, but a prognosis, so that he could tell whether his interference would be to the patient's benefit. But the trend of modern medicine with its specialism is that the surgeon dispenses with this kind of knowledge and relies upon others for instructions when to operate."

Reid and Friedlander report two cases of angina pectoris for which sympathectomy was found. One patient remained free from pain after twelve months, but was annoyed by widespread sensory disturbances. The other patient died suddenly two weeks after operation, although there had been no repetition of painful attacks.

One case is reported by Halstead and Christo-

pher. The patient was observed for fifty-two days after operation, and one attack of angina pectoris occurred.

Jennings and Jennings review twenty-one cases of operation for angina pectoris, with nineteen recoveries and two deaths. In sixteen cases the operation was resection of the cervical sympathetics, and in five resection of the depressor nerve. Relief from the anginal pain was more or less complete with both operative procedures. Either operation, therefore, cuts the pathway of the sensory nerves from the field producing angina pectoris.

Brown and Coffey believe that cutting the left superior cardiac branch of the cervical sympathetic and the main trunk below the ganglion, has eliminated the chief factor in producing anginal attacks, and apparently the one from which death occurs in attacks. They believe that it may be necessary at times to perform a bilateral operation completely to relieve the painful attacks.

The report of Reid and Eckstein is fitting in this connection; a patient developed severe pain simulating trifacial neuralgia eight days after a left cervical sympathectomy. The pain was associated with marked sensory disturbances over the entire left side of the body from the head to the costal margin.

Marvin and Harvey report a case of adherent pericardium in which extremely gratifying results were obtained by cardiolysis, according to the technique of Brauer.

A very interesting instance of stab wound of the heart is described by Davenport, in which in his operative repair he was forced to ligate the interventricular branch of the left coronary artery and vein. The patient recovered. The clinical and electrocardiographic aspects of this case were discussed by Smith in 1923.

Allen's experiments on intracardiac surgery indicate that surgical procedures inside the cavities of the normal heart of etherized dogs under the guidance of vision can be carried out with impunity, without undue haste and without interruption of the circulation. In operating on the mitral valve the approach of choice is through the left auricular appendage. Following the cutting of the mitral valve very few changes are detectable in the action of the heart. The wound in the wall of the left auricle heals perfectly, and the split in the valve does not grow together again.

In a study on blood pressure in operative surgery and in general anesthesia, Coburn found that the majority of patients show an elevation of blood pressure on entering the hospital and still more just before anesthesia. This undoubtedly is accounted for by excitement and mental stress. A fall in blood pressure usually follows deep anesthesia of some duration; it also follows severe trauma. He found that the best means of combating shock and hemorrhage was by the use of gum-glucose solution (250 c.c. given at the rate of 4 c.c. each minute) and transfusion of blood.

(To be concluded)

#### "F. & R.'S GENUINE GLUTEN FLOUR" NOT ACCEPTED FOR N.N.R.

"F. & R.'s Genuine Gluten Flour" (Farrel & Rhines Co.), according to the label, contains 40 per cent of gluten. The label contains the statement that the product complies "in all respects to the Department of Agriculture requirements for Gluten Flour." This is a reference to a Food Inspection Decision of the Department under which the designation "Gluten Flour" may be applied legally to a product which contains as much as 44 per cent of starch. The product is technically within the requirements of the government's definition of a gluten flour; it is not, however, a safe food for indiscriminate use by diabetics. When gluten flour is prescribed by physicians it is for the purpose of providing a substance that is low in starch and other assimilable carbohydrates. The Council declared F. & R.'s Genuine Gluten Flour inadmissible to New and Non-official Remedies because the application of the term gluten flour to a preparation containing 40 per cent of starch is likely to be misleading and dangerous. (*Jour. A. M. A., Feb. 14, 1925, p. 533.*)

#### RAZ-MAH, ANOTHER ASTHMA AND HAY-FEVER NOSTRUM

Are you kept awake by asthmatic attacks or hay-fever? "To sleep tonight, use Raz-Mah today." This is the slogan for a nostrum put out by Templetons, Inc., of Detroit for sale in the United States and by Templetons, Ltd., Toronto, for sale in Canada. An analysis made in Canada about four years ago showed that each Raz-Mah capsule contained a little more than 4 grains of acetylsalicylic acid, about  $\frac{1}{2}$  grain of caffeine and 8/10 of a grain of bone-black. About the same time the A. M. A. Chemical Laboratory made some tests and also reported finding acetylsalicylic acid, caffeine and charcoal. An examination recently made in the A. M. A. Chemical Laboratory showed that Raz-Mah was essentially a mixture of acetylsalicylic acid, caffeine and an iodid. Another sample of Raz-Mah, however, contained no iodid. The presence of iodid seems to be accidental and for all practical purposes, Raz-Mah may be considered to be composed of acetylsalicylic acid and caffeine. (*Jour. A. M. A., Feb. 28, 1925, p. 694.*)



TUBERCULOSIS AND OTHER RESPIRATORY  
INFECTIONS AMONG UNIVERSITY  
STUDENTS\*

J. A. MYERS, PH.D., M.D.

AND

W. P. SHEPARD, M.D., A.M.  
*Minneapolis*

In the fall of 1920 a special clinic was opened at the University of Minnesota Health Service for the diagnosis and treatment of tuberculosis and diseases of the lower respiratory tract among university students. The present paper is a brief report of the accomplishments of this clinic during the first four years of its existence.

Each student upon entering the University of Minnesota is given a careful physical examination; therefore, no attempt has been made to examine in our special clinic any students except those referred by the other physicians, or those making requests for examinations. The attendance has always been entirely voluntary on the part of the students.

During the first four years, approximately 800 students reported for special chest examination and treatment. The majority of these students have reported several times; indeed, some have been under medical supervision since the clinic was opened.

Before rendering diagnoses we have attempted to compile and analyze all possible evidence. In addition to the history and physical examination, stereoscopic x-ray plates have been requested in most cases. Tuberculin tests have been employed when indicated and within the past year the ring test has been made a routine procedure. Although it is too early to draw any final conclusions, we feel that we have been very definitely helped by this test. The vital capacity test has been employed in most cases.

In only twenty-six cases have we been compelled to render unwarranted diagnoses. These are stu-

dents who reported once but did not return for the completion of their examination. Some of them made their visits just before the end of their university course, and with the close of the school year left the city. Others, on their first visits, were told that there were rather suggestive findings in their chests which required further study, whereupon they immediately consulted their private family physicians, in whom they had extreme confidence. A few refused to return because venepunctures were done on the first visit. And, still others were lured away by medical imitations and fakers. However, this group with unwarranted diagnoses constitutes only about three per cent of the total number examined.

Table I shows a group of 197 cases in whom no evidence of chest pathology could be elicited. Some of these students reported for examination because of histories of exposure to tuberculosis. Others were referred by physicians because of questionable conditions in other parts of their bodies. By far the larger number of them reported because they had accepted the teaching that one should be examined frequently and thoroughly while in apparently good health rather than to wait until advanced disease is present. It has been most gratifying to us to see the number of such students increasing from year to year.

In our climate the incidence of acute upper respiratory infections and acute bronchitis is quite high during the winter months. However, only thirteen cases of acute upper respiratory infection were reported to our clinic. This is because such cases usually report to the physicians in charge of general internal medicine clinics and are referred to special clinics only when the condition becomes very obstinate. This is partially true also of the students suffering from acute bronchitis; however, more of them (Table I) associate cough and expectoration, although of short duration, with tuberculosis. They become somewhat alarmed and request complete chest examinations. The treatment in these cases has consisted for the most part of rest, forced fluids, mild laxatives, inhalants, cough sedatives, mild expectorants and at the proper time creosote.

Fifty-three cases have been under treatment for chronic bronchitis. Some of these cases followed gas poisoning during the world war, while others followed repeated attacks of acute bronchitis. A few of these cases have been very obstinate, par-

\*Read before the fifth annual meeting of the American Student Health Association, New York City, January 1, 1925.

From the Students' Health Service and the Department of Preventive Medicine and Public Health, University of Minnesota.

Studies on the respiration organs in health and disease XV.

Note: This study was carried out with the aid of a grant from the Research Fund of the University of Minnesota.

ticularly during the winter months. Our treatment has consisted of insistence upon well regulated living with rest playing a considerable rôle; at times cough sedatives, creosote, and inhalants. In a few instances we have resorted to autogenous vaccines, but our results have not been particularly gratifying; however, our use of the vaccines has not been sufficiently extensive to justify condemnation.

TABLE 1  
SHOWING CLASSIFICATIONS OF 803 STUDENTS AFTER SPECIAL  
CHEST EXAMINATIONS

Diagnosis unwarranted .....	26
Entirely negative .....	198
Acute upper respiratory inspection.....	13
Acute bronchitis .....	200
Chronic bronchitis .....	53
Bronchiectasis .....	5
Bronchial asthma .....	11
Acute fibrinous pleurisy .....	30
Idiopathic pleurisy with effusion .....	4
Suppurative pleurisy .....	10
Chronic fibrous pleurisy .....	23
Spontaneous pneumothorax .....	1
Tuberculous cervical adenitis .....	5
Tuberculosis of the bone .....	1
Tuberculosis of the soft palate .....	1
Tuberculosis of the kidneys .....	2
Tuberculosis of the peritoneum .....	1
Peribronchial infiltration .....	11
Peribronchial tuberculosis .....	53
Demonstrable non-clinical pulmonary tuberculosis.....	58
Arrested pulmonary tuberculosis .....	28
Apparently arrested pulmonary tuberculosis .....	14
Quiescent pulmonary tuberculosis .....	23
Active pulmonary tuberculosis .....	32
Total .....	803

Only five cases of bronchiectasis have come to our clinic. The treatment in these cases has consisted of posture to facilitate drainage along with creosote and menthol inhalations. Artificial pneumothorax and extrapleural thoracoplasty have not been resorted to in any of these patients, although they are excellent methods of treating certain severe cases. Autogenous vaccines have been employed with little or no benefit to the patients.

Bronchial asthma has been a source of considerable trouble among ten students who have reported to us. The treatment in these cases has consisted of expectorants. Forsheimer's solution has been found particularly good not only because of the expectorant it contains, but also because of its

belladonna and laxative content. In a few cases we have had to resort to the hypodermic use of adrenalin chloride and even morphine sulphate during acute attacks. For a time our cases were given the various protein tests and the diet was regulated according to the results of the tests. Later we employed the dietetic treatment beginning with an absolute fast extending over five to fifteen days. The fast is continued until all physical signs have disappeared from the chest. During the period of the fast, the patient takes three or four quarts of water per day and is given an enema daily. When all signs and symptoms of asthma have disappeared, foods are begun in a most cautious manner. On the first day the fast is broken by a glass of orange juice without sugar. On the second day, in addition to orange juice, a small portion of spinach is given. On the third day, lettuce is added. From this time only one new food is added each day. In case any symptoms of asthma appear within six hours after eating, the last food added is eliminated from the diet. We endeavor also to give proteins and carbohydrates on alternate days. By this dietetic procedure we have obtained some very good results in the treatment of chronic cases of bronchial asthma. We have not only been able to keep students in the university when previously they had felt compelled to remain out through certain seasons, but also have several asthmatic patients who have graduated and are holding good positions. These patients state that as long as they regulate their diets carefully, they suffer little or no inconvenience from asthma.

In sixty-seven cases pleurisy was present. In thirty of these cases it was of the acute fibrinous type. The treatment in these cases has consisted of rest, forced fluids, mild laxatives, strapping of the chest or the application of iodine or some other counterirritant. If the pain was very severe, mild narcotics have been employed. Idiopathic pleurisy with effusion has been diagnosed four times. Further study and observation proved that the tubercle bacillus was the etiological factor in three of these cases. Except for diagnostic purposes the fluid was not removed. Sanatorium treatment was advised for the tuberculous cases. Several of our cases of definite pulmonary tuberculosis have also presented pleural effusions.

The ten cases of suppurative pleurisy consisted for the most part of those who had previously been

operated upon or treated by the closed method. They have reported frequently for observation and study. The majority of the twenty-three cases of chronic fibrous pleurisy gave histories of some previous illness to account for their present conditions. A few, however, were entirely unaware of the time when such conditions could have developed.

In 216 cases, tuberculosis has been diagnosed. Five of these cases had tuberculous cervical adenitis. Their treatment has consisted of heliotherapy, x-ray therapy and tuberculin therapy in addition to the usual dietetic and hygienic method of treating tuberculous lesions. In each case we have attempted to prevent the breaking down of the lesions by aspirations as indicated.

There has been one case each of tuberculosis of the bone and soft palate. After confirmation by biopsy, the soft palate case was advised to use heliotherapy. This he did very religiously for nearly a year. Under this treatment, together with dietetic and hygienic regimen, he made very rapid improvement. At the present time he is in excellent condition with a full working capacity.

Two cases of renal tuberculosis had unilateral disease. In each case the tuberculous kidney was removed, after which a long period of anti-tuberculous treatment was employed. In one of these cases a definite tuberculous focus was discovered in one lung while in the other the lungs appeared perfectly clear. Both of these patients are now working; however, one has been severely handicapped by a chronic arthritis apparently of a non-tuberculous nature.

In sixty-four cases the roentgenologists have reported abnormal peribronchial conditions. Eleven of these cases were reported as having peribronchial infiltration while in fifty-three the evidence was sufficient to justify a roentgenologic diagnosis of peribronchial tuberculosis. These patients have been advised to continue their usual work, lead very well regulated lives and report for observation and study at intervals of about three months. To our knowledge, none of these students have broken down while in school. However, one of them, after graduation and under heavy strain as a pharmacist, developed moderately advanced pulmonary tuberculosis. The subsequent histories of these cases of peribronchial tuberculosis are now being studied together with similar cases from other sources.

Pulmonary tuberculosis in its various stages has been detected in 152 cases. Of these, fifty-seven were classified as demonstrable non-clinical cases. They were carefully observed over considerable periods of time, after which they were advised to continue their school work but to report occasionally for re-examinations. Twenty-eight cases were classified as apparently arrested. Most of these patients had been under sanatorium treatment, consequently they were well trained in the routine procedures in the treatment of tuberculosis. They have all been advised to keep under close medical supervision.

Twenty-three cases were classified as quiescent. Some of these have been advised to go to or return to sanatoriums. Others who have refused institutional treatment have been advised to carry a very small amount of work, lead extremely regulated lives with preponderance of rest and keep under very careful medical supervision.

The thirty-two cases of active pulmonary tuberculosis were advised to discontinue their school work and take special treatment, preferably in sanatoriums. A few of these cases deserve special citation.

A young man of twenty-one years reported for an examination of the lungs because recently we had found bilateral apical tuberculosis in his room-mate. We found in his case more advanced disease than his room-mate had. Sanatorium treatment was discussed at great length and advised strongly. Being a member of the Modern Woodmen of America, he was told that no better treatment could be provided him anywhere than in the Woodmen Sanatorium at Woodman, Colorado. After a few days he consented to make arrangements through his local lodge to go to this institution. We did not see him again until slightly more than a year later when he walked into our clinic. A glance at him told us that he had become much worse. He was pale, weak and emaciated. He said, "I am afraid I have put it off too long." Then he stated that instead of going to the sanatorium as he had planned, some well-meaning friend had convinced him that he would do better if he would go to California and "rough it." He now saw how the advice his friend had given him was not based upon knowledge of the scientific treatment of tuberculosis, but was purely the personal opinion of one who knew nothing of the subject and did not even know that he was taking a human life in his hands. On the second visit we learned that this patient was an ex-service man and that his disability was compensable. He was referred to the United States Veterans' Bureau, where he received immediate attention. Later he was sent to a sanatorium. While there, he wrote us frequently, at one time stating that the Veterans' Bureau had sent him a check for more than \$1,000.00, since at that time disability compensation was retroactive, and that he was receiving his hospitalization in addition to

a monthly check covering his total disability. Finally he became so weak that his letters began to reach us in the handwriting of a fellow patient, and a few months later the chief of the sanatorium medical staff notified us of his death. While in the sanatorium, this student had treatment which could have been excelled in no other institution, yet his disease had become so advanced and so much lung tissue had been destroyed that no treatment could restore him to health or even maintain life. As much as we shall always regret the loss of this young life, we must feel that it might have been continued save for the advice of a well-meaning friend which resulted in postponement of scientific medical treatment.

A student in our medical school came in one day with a high fever and other suspicious symptoms. He gave a history of having lost his only brother from acute tuberculosis a few months before. The history revealed also that he had been losing in weight and strength for a few weeks. Prior to this time when he was apparently in good health he had acted as donor for blood transfusions a number of times. On his first visit he was made a strict bed patient because of symptoms. The examination revealed a massive tuberculosis of the left lung which progressed with extreme rapidity. In addition to the tuberculous process he soon developed a virulent streptococcal infection resulting in bloody fluid in the left pleural cavity. Small amounts of this fluid were removed and replaced with air but with no apparent effect upon the progress of his disease. He died in the course of a few weeks. Three days before death, tubercle bacilli were found in the blood stream. We feel, as do many of his class-mates, that the blood transfusions should not have been given, particularly just after exposure to his brother with acute pulmonary tuberculosis, and while his school work was demanding so much of his time in addition to some outside work contributing to his support. Moreover earlier examination and treatment were indicated because of his slight loss of weight, weakness and temperature elevation.

A young lady was referred to our clinic because of some definite symptoms, including daily temperature elevation. The physical examination and stereoscopic plates revealed evidence of bilateral tuberculosis in the minimal stage. After study and observation extending over a week we strongly advised a period of treatment, preferably in a sanatorium. Some relatives and friends were not of the opinion that tuberculous lesions existed because "there had never been any tuberculosis in the family." They took her to a surgeon who made a fluoroscopic examination of her chest and said, "I wish my lungs were as good as yours." Still the family was dissatisfied. Finally they consulted a tuberculosis expert of more than twenty years' experience who confirmed the diagnosis of tuberculosis and placed her on the proper treatment. The last time we heard of her, she had sufficiently recovered to become a school teacher.

A young woman, aged 20, was a medical student when she noticed that her health was slightly impaired. She weighed 110 pounds. On December 6, 1920, she had a frank hemorrhage. When first seen the daily temperature rose from 101 to 103. Physical signs revealed evidence of pulmonary tuberculosis above the second rib and the third dorsal spine on the left side. Stereoscopic plates showed

a very definite parenchymatous infiltration above the clavicle and in the first and second interspaces on the left side. The sputum contained numerous tubercle bacilli.

This patient refused to go to a sanatorium, but the family promised to follow directions to the letter. She was given the usual anti-tuberculosis treatment, to which was added postural rest. She was an absolute bed patient for four months, during the greater part of which time she lay on the left side. In three weeks the temperature and pulse were normal, the cough had subsided and the expectoration was diminished in amount. The postural rest was continued over a period of four months, after which the patient was started on graduated exercise. The exercise was increased very gradually, and she has been kept under close medical supervision until the present time. Although she did not re-enter the medical school, she completed a college course, received her degree and has recently been employed as a teacher in the public schools.

Another young woman came to the Health Service for an excuse to cover absences from class. The physician to whom she applied, being a close observer, was of the opinion that she was in need of a careful examination. He at once collected a specimen of sputum, the examination of which revealed the presence of tubercle bacilli in large numbers. She was referred to our clinic, where further examination revealed the presence of bilateral pulmonary tuberculosis in the moderately advanced stage. She was advised to discontinue school and return to her physician in her home town with the thought of entering a sanatorium as soon as possible. Her physician, being very co-operative, came to the university and requested that we proceed to get her admitted to a sanatorium. After many months of excellent care in a sanatorium, this patient had so regained her health that she was able to enter the Sanatorium Nurses' Training School, where she is now enrolled as a student, perfectly happy and contented, and working with a vision of being of great service to others.

A young man came in with definite symptoms of active tuberculosis. Physical examination and stereoscopic x-ray plates revealed bilateral pulmonary tuberculosis in the moderately advanced stage. When able, he was returned to his home in Superior, Wisconsin, and advised to consult his family physician. His physician made application to a sanatorium in Wisconsin, where after nine months of excellent treatment he was discharged as an apparently arrested case. Later he returned to the University of Minnesota, where he has recently completed all requirements for admission to our Law School. He is now enjoying good health, but is keeping under close medical supervision and is leading a very well regulated life.

A young woman, recently married, reported to the clinic because of indefinite abdominal pain in the right upper quadrant and pain in the left shoulder and left side of the neck on deep inspiration. The symptoms had been increasing in severity and she had lost both weight and strength for many months but had refused medical aid previously, because she had formerly been and her mother was still a member of the Christian Science Church. Examination showed a right diaphragmatic pleurisy and a very early parenchymal lesion in the right apex. She was advised sanatorium care but dissented on account of her mother's



religious objections. The husband, himself an old sanatorium patient, argued patiently with her for a period of four weeks, during which time her sputum became positive and the pulse and temperature became markedly elevated. She finally consented to renounce her mother's domination and entered a sanatorium. Here she remained for three days until her mother's arguments and absent treatments took effect and she returned to her mother's home. Under a reader's care she was able to forsake her bed and abstain from all rest periods within a period of two days. After two months, however, her studies in Science and Health had not yet enabled her to resume her occupation and it was decided that she could concentrate better in California, whither she was dispatched with only the meager funds her husband could provide while pursuing his studies. At the end of two months more she suffered a change of faith and reported back to the clinic, desiring assistance for admission to a sanatorium. At this time she was found to have lost greatly in weight, the tuberculous process had extended throughout the right lung and into the upper lobe of the left and she was extremely anemic and weak. She was promptly admitted to a sanatorium but before long was enjoying daily visits from her mother and at the end of three weeks signed out of the sanatorium to return to her mother's home. When last heard of she had been divorced by her husband and was permanently confined to her bed.

A man of twenty-three years reported for examination in October, 1920. At this time he complained of severe pains over the left chest. Examination revealed definite evidence of pleurisy, but no evidence of pulmonary tuberculosis. The usual treatment for acute pleurisy pain was administered and an hour or so was spent instructing him regarding the possibilities of his pleurisy being of a tuberculous nature. He was advised to keep under close medical supervision. In January, immediately after the Christmas vacation, he came in with a pale appearance and showing the effects of considerable pain. The examination revealed pleurisy with a small amount of effusion. The amount of fluid increased and in a few days evidence of a very slight pulmonary lesion appeared. Sanatorium treatment was recommended at once. After several months of careful supervision and excellent treatment in a sanatorium, this patient was able to return to the University of Minnesota. He has completely regained his working capacity but he reports frequently for chest examinations.

A man of twenty-two years came in because of some lesions of long standing on one arm. In addition to these lesions he was found to have bilateral pulmonary tuberculosis in the moderately advanced stage. The pulmonary lesions were of a fibroid nature and appeared to be quite old; he was afebrile, and heliotherapy was indicated at that time. He was advised to return to the surgeon in private practice who had seen him previously. The surgeon, after rendering a diagnosis of tuberculous myositis, operated and instituted heliotherapy. The following winter the patient's health was so restored that he went to Florida to obtain an abundance of sunshine. He recently informed us that upon arrival there he secured a position with a sheet metal concern where he was compelled to work eight hours per day in the sun on roofs all winter. He allowed as much of his body to be exposed to the direct sunlight

as possible. The sinuses on his arm which had existed since February, 1921, were completely healed by March, 1922, under heliotherapy and dietetic and hygienic regimen. At the present time he is in the University of Minnesota and has experienced no recurrence of his tuberculous lesions. He is most firmly convinced that heliotherapy played the predominate rôle in the healing of his tuberculosis.

A young lady was referred to us because of a sudden onset of symptoms which were attributed to physical signs of disease over the left upper lobe. She was sent to a sanatorium, where all symptoms subsided on the usual sanatorium treatment in a few weeks. However, in the absence of symptoms the physical signs increased and a good sized cavity appeared in the left upper lobe. There was definite extension of the disease. After a few months of observation we resorted to artificial pneumothorax. An excellent collapse was obtained and at the present time this patient is nearly ready for discharge. She is planning to accept a part-time position on the University campus.

A young man came to the Health Service because of cough and recent slight hemoptysis. Tubercle bacilli were found in his sputum while physical and x-ray examination revealed evidence of a definite tuberculous lesion involving the right upper lobe. This patient was advised to enter a sanatorium, where in due time his working capacity was restored. He was returned to the university, but after a few months suffered a relapse. In addition to hemoptysis, his sputum was found to be strongly positive. He was placed in one of the health service wards and later transferred to another sanatorium. After several months of routine treatment, he had occasional slight hemoptyses, his sputum remained positive and frequent examinations and serial x-ray plates showed very definite extension of his disease with the appearance of two cavities in the right upper lobe. Artificial pneumothorax was advised. Since the first treatment many months ago, this patient has had no hemoptysis or even streaked sputum. He is improving rapidly and soon will be able to undertake light work.

In many other cases which we might cite the findings and results have been very much the same as in those cited. During the four years to our knowledge, only three students who have come under our care have died of tuberculosis. Two of these have already been cited, and the third was a case of acute tuberculosis. The remainder of our cases are either in sanatoriums making definite improvement or have been returned to the university; several have graduated and are now holding responsible positions.

We feel that two great opportunities exist in our clinic. First, that in most instances we see the students before their disease becomes advanced and while they still have splendid chances of recovery. Second, the opportunity for education regarding tuberculosis is unexcelled. The students, for the most part, are at an age when they desire informa-

tion, hence their enrollment in the university. In many instances we have spent hours in answering questions and discussing the prevention and care of tuberculosis with students who have developed the disease, or with their friends and relatives. It is true that not all the seeds sown yield an hundred fold, but we feel convinced that our students who have partially or completely recovered from tuberculosis with sound information regarding the disease, will become influential citizens in their respective communities and will become valuable workers in the campaign against tuberculosis.

#### STOP YOUR CAR TO LET CHILDREN CROSS STREET

Listen, Mr. Motorist! Have you ever had this experience? You came to a corner and noticed a child, or maybe two or three children, on the sidewalk about ready to cross the street. Have you ever thought of the thoughts that might be turbulently disturbing the little one's mind?

He has been told to be careful in crossing the street, and has been warned of all the dire mishaps that might occur to him. He has been told also that he must get to school on time. The child stands on the corner and when he sees an opening, gets ready to dash across. Then your car looms up like some gigantic ogre barring his pathway. The child darts back to the curbing, almost ready to cry with vexation and disappointment, and no doubt with his heart pounding rapidly.

Now is your chance to prove that you are human! Step on the brake, throw the clutch out and put the gear in neutral; then wave to the child to pass across.

Immediately afterward you will have a remarkable feeling of satisfaction that will more than repay you for the few moments that you may have lost. There is something about a child's smile that cannot be measured in terms of this world's goods.—*Hygeia*.

#### YADIL BLOWS UP

Yadil was supposed to be an esoteric form of garlic. It was heavily advertised throughout the British Isles and to a small extent in the United States. Then came a bomb in the form of an exposure of Yadil published in a London paper. It was a report of an analysis by an eminent chemist which declared Yadil to consist of 1 quart formaldehyde, 4 parts of glycerin, 95 parts of water and a smell. A second report was from a well known pharmacologist. There were three results from the explosion. The first and most important was that the sale of Yadil almost ceased. The second was an action for libel by the Yadil concern against the newspaper and the scientists. The third was the application by the "patent medicine" concern to prohibit further publications. The injunction was refused. Now the Yadil concern is in bankruptcy and its action for libel has been dismissed by the court. (*Jour. A. M. A., Feb. 14, 1925, p. 520.*)

#### SOME OBSERVATIONS CONCERNING TIC DOULOUREUX AFTER SIXTEEN YEARS' EXPERIENCE\*

CHARLES R. BALL, M.D.  
St. Paul

The great difficulty with statistical observations is well expressed by Carlyle when he exclaims, "To Newton and Newton's dog Diamond what a different pair of universes, although the images on the optical retina of both are doubtless the same." Statistics may be the same, while the conclusions drawn from them are often quite different. Statistics may be compared to the straw vote taken before an election. While there is nothing final or positive concerning the deductions taken from straw votes, they may be said to indicate in a general way the trend. In this analysis of 100 cases of tic douloureux we could scarcely claim more significance than for a straw vote.

*Incidence.*—Of the 100 cases, there were sixty-one females and thirty-nine males, which would indicate apparently that women are more inclined to trifacial neuralgia than men. This inference is also corroborative of our experience with neuralgias in general.

The combined ages of the 100 cases totaled 5,754 years, making the average age of all the patients in this series 50.61 years. There were two cases between the ages of 10 and 20, three between 20 and 30, three between 30 and 40, fourteen between 40 and 50, thirty-two between 50 and 60, thirty between 60 and 70, seventeen between 70 and 80, and one case between 90 and 100. The greatest number of cases (62) is found in the two decades between the ages of 50 and 70. There were only twenty-two cases before the age of 50. The youngest case was seventeen years and the oldest ninety-one. The youngest reported case which has come to our notice was in a boy of ten.

It would seem quite evident that while tic douloureux may occur in all the decades of life, the favorite ones are the sixth and seventh. In other words, it is a disease which is more inclined to make its first appearance in the later years of life. This conclusion would seem to contradict in a way our present conception of its nature. It is described as a typical neuralgia, also as a distinct

\*Read before the annual meeting of the Minnesota State Medical Association, St. Cloud, October, 1924.

entity, a disease *sui generis*, which would naturally catalogue it under the functional neuroses. Yet the functional neuroses usually show themselves early in the careers of their victims. When symptoms of a neurosis appear in the fifth or sixth decade, never having manifested themselves before that time, we are extremely suspicious of some organic trouble.

In eighty cases the neuralgia was on the right side of the face; in twenty on the left; in four cases it occurred on both sides; in one case it appeared on both sides at the same time; in the three others at different periods, the intervals varying between one and four years.

*Nervous Inheritance.*—The factor of nervous inheritance has been inquired into very carefully. In this question of inheritance as an etiological factor, Newton and his dog also applies. In the first place, there is no very definite standard as to what should constitute a nervous inheritance. It would not be unusual for some one desiring to establish his point to find inherited nervous trends in almost every family. We are aware that we might not be entirely free from such criticism. On the other hand, we all know the difficulty we have in getting a history of nervous disease from our patients, for a number of reasons. In the first place, family pride seems to resent it, and almost instinctively they deny the accusation with their first breath. In the second place, patients are not able to identify the various types of inferiority complexes, and associate them with their neuralgia. They never think, naturally, of migraine or epilepsy as having any connection with their neuralgic attacks. As an example: We had injected a patient several times for his tic pain, each time he came, asking him concerning his nervous inheritance, and always receiving a very positive negative. Finally one day he said to us voluntarily, "Oh, Doc, I wish you would give me something for my little girl. She has some kind of spells in her sleep where she jumps out of bed and screams, and we can't wake her up." A little inquiry brought the information that his mother had nocturnal attacks all her life, in which she sometimes frothed at the mouth and fell out of bed. We have included this patient in this series as having a nervous inheritance. If we had written this article two years ago, he would have been left out.

We established to our own satisfaction a posi-

tive neuropathic inheritance in sixty-four of our cases, which is perhaps more than we could do in the same number of cases of epilepsy. As a fair average of these histories, we cite the following case:

Mr. J. K.—Age fifty-three. Father, age 86, in good health. Mother died at age 74, and was subject to neuralgia of the face and head during the last few years of her life. Patient himself has suffered a good deal with sick headaches which were severe in character until the beginning of his neuralgic attacks, when the headaches disappeared.

*Relationship to Migraine.*—Some relationship has been thought to exist between migraine and tic douloureux. We called attention to this in an article in MINNESOTA MEDICINE, April, 1918. There are a number of cases in this series where, as in the case just reported, when the migraine left off, the tic began. Whether this was merely a coincidence, or indicated a definite relationship, we hesitate to say. It may at least be said to be worth noting.

The following cases are also interesting in this connection:

Mrs. T.—Age 72, father subject to sick headaches, mother subject to nervous headaches in light form. (We are quoting the patient.) Patient herself has never had sick headaches, but has had nervous headaches. Ten years ago began to have a peculiar feeling on right side of face, as of something being alive. It was not until seven years after this that the sharp, spasmodic pains of her tic began.

Mrs. C. S., age 60, never has had migraine, but when her attacks first come on she gets a sensation in her left eye as though it were being pushed out of her head. This is followed by the true tic pains. In this case the description of the sensation in the eye is typical of that given by many patients with migraine. This patient further says she has a small painful area of hypersensitiveness on the third rib in the mid-clavicular region during her attacks, which she often is only able to relieve with hot applications. The symptoms of pain and hypersensitiveness completely out of the area of the fifth nerve, and in that of an intercostal nerve, during an attack are interesting from the etiological standpoint, and quite unusual.

The next case is the most remarkable one we have ever observed in presenting transitional symptoms between the two conditions tic douloureux and migraine.

Mr. J. B. S.—Age 40; watchmaker; no history of migraine or other nervousness in the family history obtained; patient himself a dipsomaniac. For past three or four years patient has had periods of pain such as he now has coming: on at varying intervals and lasting from four to six and eight weeks in duration. He rarely suffers with the pain at night. The first thing the patient notices before the onset of an attack is a stiffening on the right side of the neck, followed by a throbbing pain in the right ear and right eye, which is succeeded by a pounding feeling in the right eye, then shooting pains into right forehead and side

of head. This continues at its height for about one-half hour, then gradually subsides. The attack begins with about one period of pain a day, which gradually increases in severity and frequency until the interval is so short between the attacks that he is unable to do anything. Last severe attack lasted about six weeks with a pain-free interval of about three weeks. Present attack began about two weeks ago. He is having now three periods of pain a day. There are apparently no "trigger zones," and eating, drinking, etc., do not bring on an attack.

In this series of 100 cases there were twenty-five who either gave a history of having had migraine themselves, or stated its occurrence in their immediate family (that is father, mother, brothers or sisters). It may not be out of place here to mention that the fifth nerve sends branches to the meninges, so that migraine itself may be only another kind of a manifestation of the pain-producing ability of the fifth.

There were four cases in this series where a history of tic douloureux was obtained in either the father or mother of the patient. One patient stated that his father began with the tic when he was forty and lived until in the eighties. In this analysis the straw vote would indicate that a neuropathic inheritance is an important etiological factor.

*Focal Infection.*—We have tried to ascertain the rôle of focal infections in the etiology. Sinus disease, nasal abnormalities, and especially the teeth, have often been suspected. The usual method of dealing with them might be termed the Chinese plan, since the Chinese, when a crime is committed, hold the neighbors responsible. The teeth have generally received the death sentence first, then the nose, and next the antrum. There has been no single structure in the anatomy of the face which has escaped condemnation. One of the series had had twenty-two separate operations on his face, the climax being reached with the removal of the right superior maxillary bone. Sixty of the patients had had one or more operations about the face. In only one case was there even temporary relief as a result of these surgical procedures. This occurred after the removal of a tooth, but the pain in this case returned later. In a number of cases the origin of the pain seemed to the patient to have been connected with carious teeth, but the removal of these teeth gave no relief. In the 100 cases there was really no direct proof that focal infection played any part as an etiological factor. The removal of every single suspicious source made no improvement.

Two cases were luetic, but the lues seemed to be incidental rather than etiological.

There was also no evidence in any of the cases of a connection between a general infection and the beginning of the tic douloureux.

*Menstruation.*—In the women of menstrual age, some were of the opinion that at the menstrual period they were more apt to have pain; others were quite positive their menstruation made no difference. In a few cases the pain began soon after the cessation of menstruation. In one case the pain came only at this time, and during two pregnancies the patient was entirely free from tic pain. This is of course interesting, but not definite enough to be very instructive.

*The Nature of Tic Douloureux.*—Thus far our inquiry as to the nature of tic douloureux has been successful chiefly in being able to state what it is not, rather than what it is. All our experience with it would indicate that it is a neuralgia and not a neuritis, yet the most of our treatment has been that of a neuritis. A neuritis signifies an inflammation with always a very definite and positive pathology. A neuritis is an organic disturbance with objective symptoms. A neuralgia is something entirely different. A neuralgia is a functional disturbance with no objective symptoms. M. Lapinsky says, "We are accustomed to designate as neuralgias the pains which are limited to the region of a certain nerve. These pains manifest themselves in attacks, reach in these attacks their height, and are followed by a pain-free interval." According to the opinion of Hardy, Valleix, Fernet, Axanfeld, Huchard, Romberg and others, since no objective symptoms have been determined by examination in the strength, the reflexes, the sensation, and the nutrition of the musculature in the area of distribution of the affected nerve, since no pathology has been found in the nerve fibres themselves, neuralgia has been classified under the functional neuroses.

The symptoms of tic douloureux conform perfectly to this description of a neuralgia. The symptoms are all distinctly subjective in character. So far as we know not a single objective symptom has ever been reported. No change in the strength, sensation, or nutrition of the parts supplied by the fifth nerve has ever been observed. We have had the opportunity of observing cases repeatedly of ten, fifteen and twenty years dura-



tion. In these cases in the interval between the attacks not the slightest disturbance of function was ever noted. The symptoms always answered to the description of a neuralgia. There was never any evolution or progression of them into anything else. The problem of their tic pain was from beginning to end the problem of neuralgia in general.

Frazier says the condition which in his opinion most resembles trifacial neuralgia is the so-called gastric crisis. The analogy is a very good one. Like tic douloureux the disturbance comes in distinct attacks with free intervals of months and years. During these intervals the stomach performs its function perfectly. The distress during the attack is often intense. Practically the same symptoms manifest themselves in the attack, again and again, and the attacks, especially in the functional cases, remain unchanged in nature over periods of years.

There are many other conditions of a strictly functional nature which resemble trifacial neuralgia. In hay-fever or asthma we are able to observe many points of similarity—the attack-like nature, the free interval, the absence of local pathology, etc. But in hay-fever and asthma we now know the symptoms are caused by a constitutional anaphylactic reaction in the patient to certain proteid substances, notably the various pollens.

Migraine is doubtless another such reaction, although the nature of the anaphylactic factor has not been determined as in the case of hay-fever.

It is interesting to observe that the symptoms of all three of these conditions are but different reactions in the distribution of the fifth nerve.

It is also worthy of note that, although we know absolutely that hay-fever is a constitutional anaphylactic reaction, the anaphylactic symptoms occur in the same structures over and over again, which suggests the probability of the so-called conditioned reaction. This suggestion applies equally as well to migraine and tic pain.

In fact, when we get right down to brass tacks, as General Dawes expresses it, there is no condition of which we know anything about, presenting similar symptoms, periodicity, free intervals, without pathology, that is not constitutional and also doubtless anaphylactic in character.

*The Sympathetic System.*—Frazier has made a suggestion in connection with trigeminal etiology, which is stimulating especially at this time since

the sympathetic system in its relation to causalgias, angina pectoris, and other conditions especially vascular and painful in nature, is receiving so much attention. In an article on neuralgia of the face he says, "Looking for a parallel in other nerve tracts, we are reminded of the burning sensation in causalgias of the median nerve, and of the relief afforded by the Leriche operation on the periarterial sympathetic plexus. With this in mind we selected from our series a patient who complained of a burning sensation in the gums, a sense of pins and needles in the face, and a burning sensation below the eye. With a view to determining what effect sympathectomy would have, the superior cervical sympathetic ganglion was removed, and the periarterial sympathetic plexus stripped from the common carotid artery on the affected side. The operation relieved the burning feeling in the cheek, and the dry feeling in the eye disappeared." He significantly adds, "We hesitate to speculate as to what influence this operative result may have on our solution of some of these intricate problems." Such questions arise as to whether the etiology of tic douloureux does not lie entirely in the sympathetic system, the fifth itself being only the innocent pathway; also whether the pain originating in the sympathetic system and that coming from the cerebro-spinal system may not have distinctly differentiating qualities. There are a host of interesting questions which arise, but we must stop wondering before we illustrate too vividly the vast difference in the two universes between Newton's eyes and his dog Diamond's.

*Duration.*—The average length of time the tic had existed in the 100 cases was 6.67 years. This period varied in the different patients from a few months to twenty-five years. It seems to us that in the duration of tic pain over such long periods of time without any essential change in its nature there is to be found one of the strongest arguments against its neuritic and infectious character, and in favor of its functional origin. Such a neuritis as the symptomatology of tic douloureux presents has never been observed elsewhere. Actual disease either progresses or recedes. A functional nervous disturbance may go on indefinitely, especially if the disturbed function only recurs at intervals.

*Alcoholic Injections.*—All of the 100 cases were treated by alcohol injections according to the

method of Levy and Boudoin, sometimes called the external method, where the point of entrance of the needle is through the skin of the face, and each branch of the fifth is reached from different locations. Three hundred and thirteen injections were given in all, some of these injections being superficial, that is—made at the point of exit of the supra- and infra-orbital branches of the first and second divisions of the fifth and the infra-dental branch of the third division. The majority of the injections, however, were deep—that is, made at the points of exit of the second and third divisions of the nerve where they emerge from their respective foramina—the foramen rotundum, and ovale at the base of the skull. Thirty-nine injections were made in twenty-five patients who did not return, so the duration of their relief is unknown. Two hundred and seventy-four injections were made in seventy-five patients. In forty-four of these patients two or more branches of the fifth were involved so that at least two injections had to be given, no matter how good a hit of the nerve was made. The seventy-five patients received 3.65 injections apiece, and obtained a total of 753 months' relief, an average of a fraction over ten months per patient.

Of the 100 patients there was only one who gave us a fair trial—that is, an opportunity to hit the nerves affected—who did not obtain relief from his pain. In this case the trigger zone apparently was around the eyes, involving the cornea and conjunctiva in the distribution of the first division. Here we failed completely.

As an example of the relief the alcohol injection gives in the average tic pain case over a period of years, the following case will give one a good idea:

Mr. M. P.—Age 50, janitor, had a tic pain in the second branch of the right fifth nerve. Patient's home is in St. Paul, so when he gets a return of his pain he comes at once for an injection. He was first injected February 7, 1918, then April 9, 1919, September 21, 1920, June 2, 1922, February 22, 1923, and the last time June 21, 1924. Over a period of six years this patient has had six injections, and during the entire time has been rendered practically pain-free by them. In individual patients the relief period in this series has varied from a few weeks to ten years. The case cited above, however, is representative of the relief the usual case may expect from treatment by alcohol injection.

There were no fatalities or serious accidents as a result of the injections. In a few cases hemor-

rhage was troublesome, especially into the orbit. In one case the bleeding into the orbit was so profuse that the ball of the eye was pushed partially out of the socket. In this case a temporary blindness, lasting several hours, resulted, occurring apparently from the pressure of the hemorrhage on the optic nerve. In one of the cases where the pain was on both sides of the face, involving on each side the third division, the injection caused, as one might expect, a paralysis of the internal and external pterygoid muscles and a dropping of the lower jaw. This patient had to keep her jaw tied up for several weeks.

In this series, four of the patients, and the only ones so far as we know (there may have been others) submitted to the operation for the avulsion of the posterior root. Three were operated on by skilled neurological surgeons. Two died within forty-eight hours after the operation, and two within a week. Of these cases, two were under sixty years of age and in quite good physical condition, and two were over seventy and their general condition was feeble. We realize of course that the 100 per cent mortality of these four cases does not represent at all the very low mortality of the present avulsion operation, but since these cases come in the analysis of this series we mention them.

Summarizing our analysis of these 100 cases, we find:

1. Women much more frequently affected than men.
2. The majority of the cases appeared in the sixth and seventh decades.
3. The involvement of the right side of the face was four times as frequent as the left.
4. Evidence of a distinctly neuropathic inheritance in 64 per cent of the cases.
5. Absence of any evidence to indicate focal infections as an etiologic factor.
6. No reason to consider tic douloureux as a neuritis, but rather as a true neuralgia, and belonging with the neuralgias under the classification of the functional neuroses.
7. And finally that the alcohol has stood the test of time and gives relief for the pain in tic douloureux indefinitely when the injections are repeated, without practically any danger of serious accidents or unpleasant complications.

## REFERENCES

- Lapinsky, Michal: Zur Frage über den Mechanismus den (so genannten) wüzel Neuralgia des Nervous Schiadicus. *Archiv. für Psychiatrie und Nervenkrankheiten*, Feb. 17, 1923, s. 600.
- Frazier, Charles H., and Russell, Ethel C.: Neuralgia of the face. *Arch. Neurol. and Psychiat.*, May, 1924, ii, 557-563.
- Patrick, Hugh H.: The technique and results of deep injections of alcohol for trifacial neuralgia. *Jour. Am. Med. Assn.*, Jan. 20, 1912, lviii, 155-163.

## DISCUSSION

DR. A. S. HAMILTON (Minneapolis): I think Dr. Ball's reference to Newton and his dog and what they, respectively, saw is very well applied to his presentation as respects the treatment of tic douloureux in the hands of the surgeon, on the one hand, and of the one who uses injections of alcohol on the other hand. Only, he modestly avoids telling us which represents the dog.

There has been considerable literature on this subject in recent years and Cushing, in particular, has insisted that the radical operation for tic douloureux, in his masterly hands, is practically without fatality. At the same time, he has referred to a number of very unhappy complications that have been seen among the patients submitted to him for operation and who had previously undergone the alcoholic injection treatment. It seems to me, however, that there are certain very important points for consideration before we determine the relative merits of these two procedures. There are three men in the United States at present, Cushing, Adson and Frazier, who have particularly distinguished themselves in the surgical treatment of tic douloureux, but what these men can do in the way of operative treatment, of course, cannot be done by every other man who chooses to operate and for Cushing to compare his results with those seen as a result of alcoholic injections, doubtless done many times by individuals who were illy prepared for the work, is hardly fair to either procedure. If one is to make comparisons at all, one should compare the results of masters, such as Cushing, with the experience of those who have carried on the alcoholic injections treatment for a long time, as has Dr. Ball, with such distinguished success.

Dr. Ball has covered the whole subject of tic douloureux fully in his paper and has spoken of the fact that in this condition we are dealing with a neuralgia, not a neuritis, and that there are no objective signs.

From Cushing's clinic, we have had a study of a number of Gasserian ganglia where operation has been done on the peripheral nerve and, in all these cases, there was a change in the nerve cells of the ganglion, but in all those instances where no surgical procedure had been carried out, there was nothing to be found in the ganglion, and it was the opinion of Bailey, I think, that the lesion was in the end organs of the nerve. Of course, there is no absolute proof of this statement and not everyone would agree with it.

In the discussion, it may be opportune to refer to some of the problems in diagnosis of tic douloureux. Dr. Ball referred to one case in which he had been unable to secure relief, even when the patient submitted fairly to treatment.

I wondered if that might possibly refer to one of those cases which Sluder has popularized, known as sphenopalatine ganglion syndrome. I have heard Sluder describe it and think it is generally accepted that the syndrome he developed is fairly well founded. The difficulty about it lies in his inclusion of such an enormous number of symptoms, that it becomes difficult to see how they can all arise out of one locality, and one wonders whether the anatomical basis of his syndrome is well established.

In this particular case Dr. Ball spoke of the pain about the eye, and Sluder refers to that especially. It is a matter of record also that there are cases where the alcohol injection or radical surgery has been carried out without relief, and where Sluder's procedure has later effected a cure, and vice versa, so that the error in diagnosis is certainly a possible one.

In any case of typical trifacial neuralgia, the diagnosis is easy, but the cases are not all typical. There are cases of herpes, for example, where diagnosis is difficult, but in these there is a burning pain, the pain does not spread to other branches and there are no typical paroxysms with spasmodic contraction of the face.

Dr. Ball referred to the relation of migraine to tic douloureux and there are cases of constant pain in the face which have been mistaken for tic douloureux; but a constant pain at once denies the idea that these cases belong in the group of neuralgia, for a neuralgia, necessarily, has an intermittent pain. Also, there are cases of constant pain where pressure is exerted on the fifth nerve and also in cases where a tooth is involved. These have been mistaken for trifacial neuralgia. Then, there are cases of purely functional origin.

In all these groups, the diagnosis has been mistaken at times and I think anyone who deals with trifacial neuralgia or like conditions will admit having had trouble at times.

Even if one looks at these cases through the eyes of the most enthusiastic surgeon, I think one must admit that, in cases of trifacial neuralgia, where only one of the lower branches of the fifth nerve is involved, it would be proper to submit the case to alcoholic injection and, if the result is satisfactory, one might go on with that procedure. On the other hand, I think almost anyone will admit that in these cases where all the divisions are affected, where the case has proved intractable when treated by alcoholic injection and relief cannot be obtained, or is only temporary, one should resort to radical surgical procedure, assuming that the case is a good surgical risk.

One of these cases of Dr. Ball was an individual I sent him some years ago. He was an old man and got along very satisfactorily for five or six years, with intervals of relief of at least one year on the average. Finally, he developed melancholia and went south and some of his friends induced the family to believe that the melancholia was due to anxiety over this recurring pain and that to have an operation on the fifth nerve would be to recover from the melancholia. The patient submitted himself to operation at the hands of a most acceptable surgeon and died three or four days afterward. This constitutes no charge against radical operation as the man was really an unsuitable risk, but, if one is to make comparisons between the results of alcoholic injection and surgical operation, I think

it should be on the experience of such men as Dr. Ball and such men as Dr. Cushing, and we should not accept the results for comparative purposes of everyone who has chosen to do this alcohol injection.

Dr. J. P. SCHNEIDER (Minneapolis): Dr. Ball's large series of cases and his method of treatment is well known to most of us, and personally I have, up to the past few years, gladly sent these patients promptly to Dr. Ball for treatment.

However, in the last several years, we have discovered that in elderly patients with tic douloureux who are edentulous, the bizarre movements and displacements of the inferior maxillary bone can produce trauma of the inferior dental branch of the fifth nerve and lead to this factor being the trigger which sets off the tic attack.

In this type of case we have had three very excellent results at the hands of Dr. Everett E. MacGibbon by properly built-up plates, preventing this trauma. I wish to draw your attention to this type of case, for the solution is a very happy and permanent one.

Dr. CHARLES R. BALL (concluding): Members of the State Medical Society: First, let me acknowledge my indebtedness to our Chairman, Dr. Tuohy, for the technique of preparing the radio mats. Knowing that he had information on all things, especially relative to medical affairs, I applied to him for information, and received from him a full description of the method of preparing these radio mats for presentation.

Answering the question of Dr. Hamilton as to whether these cases in which I failed to relieve by injection were in the region of the sphenopalatine ganglion, I will say that the trigger zone area in these cases seemed to be in the distribution of the first branch in the conjunctiva and especially the cornea of the eye. I have found in my experience where the trigger zone lies in this location that it is very difficult to attain an anesthesia sufficient to shut off the pain-stimulating impulses.

Dr. Michael's point, concerning the ages of these patients being against the assumption of a functional neurosis, is a good one. Functional neuroses do not usually make their first appearance after fifty years of age. The answer to this argument is simply that functional neuroses very often change in their symptomatology, and that tic douloureux in these later decades is merely a transformation of some other neurotic disturbance which existed in the earlier years of the lives of these patients.

In regard to other treatments for the relief of the tic pain, for the past year we have been experimenting with different things. We have, of course, used the strychnine and aconite, but in our experience these treatments have proven to be uncertain and unsatisfactory. Recently we have tried out the effect of protein injections, using, in the first instance, peptone, and later milk injections because the peptone did not give a marked enough reaction. But in none of the cases treated so far has there been any result obtained worth reporting.

#### ZINC SALTS IN GONORRHEA

The so-called zinc borosalicylate preparations which are at present being exploited for the treatment of gonorrhea are not new. Such a preparation was exploited in Germany ten or fifteen years ago under the name of "Dr. A. Foelsing's Mucosan"; analysis made about that time threw doubt on the claim of its being "a definite compound"; rather, under the scrutiny of German chemists, the product seemed to be a loose combination of zinc salicylate, salicylic acid and boric acid. Recently, there has been an active campaign to influence American physicians to use the product, this time under the proprietary names of "Neisser-San-Kahn" (York Laboratories, York, Pa.) and Zinc-Borocyl (Al Sano Chemical Products, Chicago). Both are recommended for genito-urinary work, particularly local infections of the urethra. The Council on Pharmacy and Chemistry, in its reports on these two products, stated that the submitted evidence failed to show that the preparation claimed to be zinc borosalicylate has any advantage over established zinc salts; that zinc sulphate is indicated in only certain forms of urethritis; and that the use of substances that are unessential modifications of established drugs is unscientific, serves no useful purpose, and is not in the interest of rational scientific therapy. (*Jour. A. M. A., Feb. 28, 1925, p. 696.*)

#### "ORGAN-O-TONES"

From the advertising, it appears that the Cole Chemical Co. is engaged in the marketing of "shotgun" mixtures, largely of the "pluriglandular" type. For a year or more it has been "pushing" a mixture "for obesity" designated "Organ-O-Tones No. 19." The preparation is marketed in capsules which have been stated to contain: "Thyroid Substance"  $\frac{1}{2}$  gr., "Pituitary (whole)"  $\frac{1}{4}$  gr., "Phytolaccin"  $\frac{1}{2}$  gr., "Apocynum (P.E.)"  $\frac{1}{4}$  gr., "Organ-O-Tones No. 12" (composed of sodium bicarbonate, potassium bicarbonate, calcium glycerophosphate, calcium phosphate (dibasic) and magnesium phosphate  $3\frac{1}{2}$  grs. It is evident that Organ-O-Tones No. 19 for Obesity is an irrational mixture which depends for its action as an "obesity" remedy on the thyroid which it contains. The firm's advertising does not stress the formula and hence it is probable that those who use this preparation do so without full appreciation that they are administering thyroid. More than sixteen years ago, Reid Hunt and Atherton Seidell called attention to the misuse of thyroid as an ingredient of "antifat" nostrums. Since then the ill effects of thyroid as an anti-fat have become well established. Recently H. S. Plummer and Wm. Boothby warned against the uncontrolled use of thyroid in obesity. (*Jour. A. M. A., Feb. 28, 1925, p. 698.*)



# MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION,  
SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN  
MINNESOTA MEDICAL ASSOCIATION, AND MINNE-  
APOLIS SURGICAL SOCIETY

Owned and Published by  
The Minnesota State Medical Association  
Under the Direction of Its

## EDITING AND PUBLISHING COMMITTEE

R. E. FARR, M.D.                      JOHN M. ARMSTRONG, M.D.  
Minneapolis                      St. Paul  
L. B. WILSON, M.D.                F. L. ADAIR, M.D.  
Rochester                      Minneapolis  
J. T. CHRISTISON, M.D., St. Paul

## EDITORIAL OFFICE

CARL B. DRAKE, M.D., Editor  
402 Guardian Life Bldg., Saint Paul

## BUSINESS OFFICE

J. R. BRUCE, Business Manager  
402 Guardian Life Bldg., Saint Paul  
Telephone: Cedar 1683  
201 Commercial Bldg., Minneapolis  
Telephone: Atlantic 2716

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of \$1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VIII                      APRIL, 1925                      No. 4

## EDITORIAL

### The State Meeting

This year's annual meeting comes so early in the year that it is hard to realize that the month of the meeting is actually upon us. The program committee and the committees on arrangements, however, have been at work and the program which appears in this issue under Society Meetings indicates that an unusually fine program has been arranged.

A medical convention is often the occasion for attempts at sensational announcements of medical news by the newspapers. The appointment of a publicity committee in connection with the Minneapolis meeting is a wise move and it is to be hoped that all newspaper publicity will be handled by this committee and that individual members approached by reporters refer them to members of the committee.

The officers of the component county societies have had too little recognition at our state meetings. The county societies after all make up the state association and in a sense the officers of the component societies are state medical officials. In recognition of this fact President Burnap is contemplating official recognition of the county presidents and secretaries. He is particularly desirous that the county officers be present at the Monday night meeting when subjects of great practical importance to the profession at large—and this means the county societies—will be presented. It is planned to have a roll call of the county secretaries at this particular meeting.

The combination of Minneapolis Clinic Week with the State Meeting this year and the emphasis being laid on clinical demonstration in the State program will afford abundant opportunity for those in attendance to see a variety of clinical cases.

Let's make this year's meeting a record breaker in attendance. The program warrants it.

### Education of Future Dentists

By the publication of a recent report\* of the Dental Faculties' Association of American Universities, the work of this important association in the advancement of the standards of dental education in this country between the years 1908 and 1924, has become available. Viewed thus in retrospect, there are evidenced very marked changes in dental school curricula. The tendency of these changes has often aroused discussion as to whether it would not be better, after all, to make the same requirements for prospective dentists as those made for prospective physicians, and many prominent leaders and educators in both the medical and dental professions openly advocate fusing the dental and medical schools and making the practice of dental surgery a specialty in the practice of medicine.

The problem presented by these proposals is not simple of solution. On the one hand, largely based upon expediency, are presented the arguments for a comparatively short period of professional study, thus saving expense and time to the dentists and perhaps expense also to their clients. It is true that considerable work required of professional dentists is largely mechanical and does not demand any profound educational qualifications except that of experience. This is true, however, of every other profession; and such work in all professions, and even today in that of dentistry, is being carried on either by those in the profession who have a partic-

\*Minutes and Proceedings of the Dental Faculties' Association of American Universities, 1908-1924, University of Minnesota.

ular aptness for that sort of work or by well trained non-professional assistants.

Through the whole discussion stands out, in prominent relief, the basic fact that lesions in or around the teeth have as fundamental a significance for the general health of the individual as have those in almost any other part of the body, and, consequently, that judgments in regard to the proper prophylactic care and treatment of the diseases of these tissues must be made with due regard to the general health of the individual as a whole. Many doctors of dentistry have succeeded in an admirable way in meeting these new demands on their profession, but those who have not received due training in general medicine, have often found themselves at a disadvantage in problems which vitally concern their patient's welfare.

That the education of dentists as well as that of medical students is undergoing a rather profound evolution there can be no doubt. That to a certain extent this evolution will be beyond the foresight or control of the present generation must also be admitted. However, wise counsel and sane judgments may prevent some mistakes. We are particularly impressed by the broad viewpoint of those who are at present in control of dental education in this country.

H. E. R.

### Periodic Health Examinations

One's earliest reaction to a general program to bring about these routine investigations of large groups of people (including the apparently healthy) is apt to be unfavorable, but as one analyzes the unfavorable features involved, it becomes clear that most of them arise from defects within the profession, rather than anything intrinsic in the plan itself. For example, the physicians who have never schooled themselves in routine or who have long abandoned it in the scramble of looking out for immediate complaints, are going to miss the whole idea and give the lay applicants who seek these examinations nothing for their trouble except the remark that they should "forget it."

Then over and against this skepticism of physicians who see enough trouble without digging for it, comes the equally obvious fact that misdirected routine is likewise often fruitless. Skilled routine is at its best only when directed by a good sense of proportion, likelihood, and the "law of averages." Subjective disorders (so often the fore-

runner of definite disease entities) are so likely to be passed over and neglected in the zeal "of a search for the obvious." Fully seventy-five per cent of the patients consulting the average doctor come with *subjective complaints*. All too often we are not much interested and show it all too plainly. Often this lack of interest comes from a lack of familiarity and knowledge. No fitting public appeal for "General Health Examinations" can be made before we agitate these principles among ourselves. Life insurance examinations have been made for many decades, but is it not a fact that they are all too perfunctory and very often fail to reveal the true facts involved? Health examinations on a big scale are surely coming. Are we broad enough to adapt ourselves to the needs and humble enough to master the technique of the essentials involved?

E. L. T.

### Life Extension Institute

In 1909 Dr. Burnside Foster, then editor of the St. Paul Medical Journal, in an address delivered before the Life Insurance Presidents Association, recommended the physical examination of insurance policy holders every five years and predicted that the lowering of mortality rate would more than cover the cost. Although the idea was considered rather fantastic at the time, Dr. Eugene Lyman Fiske, then Medical Director of the Provident Saving Life Assurance Society, was impressed with the idea and instituted yearly examinations of policy holders in his company. Several thousand availed themselves of the opportunity, a sufficient number to demonstrate that such a procedure was a money saving proposition to insurance companies and a life saving proposition in general.

As a result of this experience the Life Extension Institute was organized in 1913 on a semi-philanthropic basis with sufficient business aspect to insure efficient management. The project was backed by Mr. Harold A. Ley in a financial way and moral support was rendered by such men as Professor Irving Fisher of Yale University, William H. Taft and a number of prominent physicians in the East. The main purpose of the Institute was to detect morbid processes early through periodic examinations in order to prolong life. This should be a service both to the individual and life insurance companies associating themselves with the Institute. The Metropolitan Life Insurance Company associated itself with the Institute from the start and its experience

was such that other insurance companies to the number of forty have been enrolled.

In the supplementary report of the Judiciary Council of the A. M. A. rendered at the last meeting of the Association at Chicago in June statements were made regarding the activities of a commercial periodic health examination institution, obviously the Life Extension Institute, which were either intentionally or otherwise incorrect. In brief, this report accused the Institute of paying a nominal fee to their examiners and selling the information thus gained to the insurance companies. It was stated that industrial houses were informed by the Institute of the physical condition of employees whose examination could be arranged for by contract. It was further claimed that the Institute was organized for commercial gain and stated figures purporting to show the Institute was making large profits.

The Board of Directors of the Life Extension Institute in answer issued a statement which was sent to the A. M. A. headquarters in which the statements of the Judiciary Council above mentioned were flatly contradicted. Communications as to the physical condition of those examined are held in the strictest confidence and a statement of the financial status of the Institute indicates clearly that it has not been a money-making proposition. There was a deficit of nearly \$200,000 during the first five years of the life of the Institute and it was not until 1923 that a small dividend of 3½ per cent was paid and this on the preferred stock only. For every share of preferred stock issued three shares of common stock have been issued and two of every three shares of common stock have been turned over to the Honorable W. H. Taft and Professor Irving Fisher as trustees under an agreement that any dividend which may be paid on this stock shall be devoted to philanthropic public health work.

The reputation of the individuals sponsoring the Institute is such as to warrant belief in the honesty of the project. It seems unfortunate to say the least that the A. M. A. report so twisted the facts as to produce such an unjust conception.

Viewed from an impartial standpoint the Institute is rendering a definite service by furthering the cause of periodic physical examinations. While we as physicians have recognized the importance and value of such examinations we have not been in a position to push the idea. As a matter of fact, we as a profession have been slow to get the view-

point of the so-called health examination. Trained to interpret subjective and objective symptoms we have been slow to grasp the importance of early detection of errors in personal hygiene and the beginning of morbid physical processes.

On the other hand there can be no question but that, given two equally efficient physicians, the one who personally examines an individual is better able to prescribe than the one who simply examines another physician's report. The distant examiner is only too likely to prescribe diagnostic procedures such as the electrocardiogram, x-ray of the heart, glucose tolerance test, etc., which look well on paper but are impractical and unwarranted in many cases.

If there is a need for such organizations as the Institute to sell the idea of periodical examinations to the public then the Institute is on the right trail when it directs the individual to his own physician for investigation along certain lines and gives specific directions as to matters of personal hygiene. Suggestions as to diagnostic procedures and medical and surgical treatment advisable in any case might well be left to the local adviser.

The Life Extension Institute is the largest of the concerns conducting so-called health examinations. Numerous other organizations have been flourishing during recent years, some of which limit themselves to quarterly urinalyses and instructions regarding personal hygiene. Some of these organizations are purely money-making schemes and broadcasted circulars contain preposterous statements to catch the gullible. The examination in some is limited to quarterly urinalyses and the elaborate reports are in large part worthless and confusing. Such organizations cannot be too severely condemned.

What is the solution of the entire proposition? The value of the periodic physical examination has been generally recognized by the profession as well as the public. The health examination forms painstakingly prepared by our A. M. A. committee should be convenient and useful to all physicians likely to be called upon to render such examinations, and 100 forms may be obtained from headquarters on remittance of the modest sum of seventy-five cents. The patient fills in one side of the form previous to the examination, which is greatly facilitated thereby. The form serves also to standardize the examination and is an aid in carrying out a thorough examination. Here is a practical way in which we can meet the situation.

## OBITUARY

### DR. DAVID OWEN THOMAS

Dr. David Owen Thomas was born in Wales, Nov. 21, 1852, and came to the United States at the age of nineteen. His high school education was obtained in Wales and his college degree at Bethany College, West Virginia, in 1878. At this time he was studying for the ministry. After this he studied medicine at the Medical College of Indiana, from which he was graduated in 1884. He did post-graduate work in Columbia University and at St. Bartholomew's in London. He was a member of the Royal College of Surgeons and of the London Royal College of Physicians.

Previous to coming to Minneapolis, he had practiced in Knightsville, Indiana. He practiced medicine in Minneapolis for many years, and at one time was teaching in the Medical Department of Hamline University. He was a member of Asbury Hospital staff, and of the County, State and American Medical Associations. He was president of the Hennepin County Medical Society in 1905, and chairman of the Board of Censors for many years.

While he was a medical student in the Medical College of Indiana he won the gold medal for competitive essay with a treatise on cesarean section.

Dr. Thomas was a very active member of Disciples of Christ Church and had a national reputation as a scholar in biblical research. He had gathered a library of unusual significance, containing rare and valuable manuscripts and books not often found outside of great libraries. He imported many books for his special study. He not only read in his native tongue, Welsh, but also in Greek and Hebrew.

Dr. Thomas died after an acute illness following a period of ill health of several months' duration, at his home on February 11, 1925. Mrs. Thomas was absent at the time of his death, returning from a trip around the world. They had planned to meet in the early summer at Dr. Thomas' birthplace in Wales and return to Minneapolis together.

### DR. E. L. MANN

Dr. E. L. Mann of St. Paul died suddenly March 14th at the Edgewater Beach Hotel in Chicago. He was on his way home from Savannah, Ga., where he went in December for his health.

Dr. Mann was born in St. Paul in 1861 and practiced his profession in his native city. He attended Hobart College, Geneva, N. Y., and the Hahnemann College of Medicine at Philadelphia, where he received his medical degree. After graduation he studied in Berlin and Vienna, specializing in ear, nose and throat diseases. For a time he was Dean of the homeopathic department at the University of Minnesota medical school until it closed about fifteen years ago.

Dr. Mann was a member of his county, state and national medical societies, a member of the Town and Country club and was held in esteem by his confreres and fellow citizens.

## REPORTS AND ANNOUNCEMENTS OF SOCIETIES

### MINNESOTA STATE MEDICAL ASSOCIATION

An unusual and valuable feature of the annual meeting of the Minnesota State Medical Association, to be held at the University Medical School, Minneapolis, April 27, 28 and 29, will be the "Medical Economics" session, to be held at the Anatomical Auditorium the opening night of the meeting.

"Periodic Examinations," which at the present time are being advocated by the health organizations of the country, will be discussed from the standpoint of the physician by Dr. Frank Billings, former president of the American Medical Association.

The rest of the Monday night program will be given over to discussion of the various phases of medical defense by national and state authorities, including Dr. W. C. Woodward, chairman of the Judiciary Committee of the American Medical Association; Dr. E. Starr Judd of the Mayo Clinic, and Mr. Fred E. McLucas, attorney for the Medical Protective Company, Fort Wayne, Indiana. The complete Monday night program follows:

Periodical Medical Examinations—Dr. Frank Billings  
Medical Defense—Dr. W. C. Woodward  
Don'ts for Malpractice—W. H. Oppenheimer of the State Association's Legal Firm  
National Defense—Major Irving M. Madison  
Corrective Legislation—Fred E. McLucas  
State Legislation—Dr. H. M. Johnson  
Substitute Medical Defense—Dr. E. Starr Judd

The usual meeting of the Council of the Association will be held Monday morning and of the House of Delegates in the afternoon.

Dr. W. D. Haggard, Nashville, Tenn., president of the American Medical Association, will be among the out-of-state speakers on the program. He will give a clinical demonstration in the Medical and Surgical Joint Section to be held Tuesday morning, and will be the principal speaker at the Tuesday night banquet to be held at the Radisson Hotel, Minneapolis. Other speakers at the banquet will be: Dr. W. J. Mayo, who will act as toastmaster; Dr. Frank Billings, Governor Theo. Christianson, Mayor George Leach of Minneapolis and Dr. Willard L. Burnap, president of the Minnesota State Medical Association.

Hotel headquarters for the meeting will be at the Radisson, where the visiting physicians will be entertained at a smoker Wednesday evening by the Hennepin County Medical Society.

Thursday, April 30, will be Clinic day and a series of Clinics, part of Minneapolis Clinic Week, will be conducted by members of the Hennepin County Medical Society. A golf tournament to be held Monday is an additional feature.

Special effort has been made this year to work out a well-rounded program which will be of value and interest to every physician in the state, and a large attendance is urged. That physicians make a special effort to arrive



for the Monday night meeting is the request of those in charge of the program.

Roll call of the secretaries of the Component Societies will be held Monday night.

Among those who are active in arrangements for the meeting are the following:

- Dr. W. L. Burnap, President, Fergus Falls
- Dr. W. A. Jones, Hennepin County Clinical Section
- Dr. W. A. O'Brien, University of Minnesota
- Dr. F. A. Erb, Chairman of the General Arrangements Committee
- Dr. Emil Geist, President Hennepin County Medical Society
- Dr. Harry Ritchie, Chairman Surgical Section, M. S. M. A.
- Dr. O. J. Hagen, Secretary Surgical Section, M. S. M. A.
- Dr. L. G. Rowntree, Chairman of the Medical Section, M. S. M. A.
- Dr. F. J. Hirschboeck, Secretary of the Medical Section, M. S. M. A.
- Dr. A. S. Hamilton, Vice President, M. S. M. A.
- Dr. John Libert, Vice President, M. S. M. A.
- Dr. C. W. More, Vice President, M. S. M. A.
- Dr. E. A. Meyerding, Secretary, M. S. M. A.

#### SCIENTIFIC PROGRAM

TUESDAY, 8 A. M., APRIL 29, 1925—

Joint Session, Medical and Surgical Sections. The University Campus.

1. Clinic on Tumors of the Lymph Glands
  - (a) Clinical Presentation—Medicine. Dr. J. P. Schneider, Minneapolis
  - (b) Surgical Demonstration. Dr. Harry B. Zimmerman, St. Paul
  - (c) Roentgenologic and Radium Treatment. Dr. A. S. Fleming, Minneapolis
  - (d) Pathological Demonstration. Dr. E. T. Bell, University of Minnesota, Minneapolis
2. Clinic on Bone Tumors
  - (a) Clinical Presentation. Dr. H. W. Meyerding, Rochester
  - (b) Pathological Demonstration. Dr. W. C. McCarty, Rochester.
3. Tumors of the Breast
  - (a) Clinical Demonstration. Dr. W. D. Haggard, Nashville, Tenn.
  - (b) Pathological Demonstration. Dr. W. A. O'Brien, University of Minnesota, Minneapolis

WEDNESDAY, 8 A. M., APRIL 29, 1925—

Joint Session, Medical and Surgical Sections. The University Campus.

1. Diabetes Mellitus
  - (a) Clinical Demonstration. Dr. A. H. Beard, Minneapolis
  - (b) Surgery in the Diabetic. Dr. A. A. Law, Minneapolis

#### 2. Diseases of the Thyroid

- (a) Clinical Demonstration. Dr. H. S. Plummer, Rochester
- (b) Surgical Consideration. Dr. J. deJ. Pemberton, Rochester

#### 3. Diseases of the Other Glands of Internal Secretion.

Dr. H. L. Ulrich, Minneapolis

#### 4. Clinic on Neurology

- (a) Nervous Disorders in Pernicious Anemia. Dr. A. S. Hamilton, Minneapolis
- (b) Early Diagnosis of Tabes Dorsalis. Dr. J. C. McKinley, Minneapolis
- (c) The Sequela of Encephalitis. Dr. E. M. Hammes, St. Paul
- (d) Surgery in Spinal Cord Tumors. Dr. A. W. Adson, Rochester
- (e) Clinic on Speech Defects. Dr. Smiley Blanton, Minneapolis

#### MEDICAL SECTION

TUESDAY, APRIL 28, 1925, 2 P. M.—

1. The Medical and Roentgenologic Management of Hyperthyroidism. Dr. M. J. Kern, St. Cloud, Minn. Discussor: Dr. E. T. F. Richards, St. Paul.
2. Effect of Environment Upon the Upper Respiratory Tract and Clinical Significance. Dr. H. I. Lillie, Rochester. Discussors: Dr. J. A. Pratt, Minneapolis; Dr. Horace Newhart, Minneapolis.
3. Observations on the Chlorine Treatment of Acute Respiratory Infections. Dr. H. S. Diehl, University of Minnesota, Minneapolis. Discussors: Col. E. B. Vedder, Washington, D. C.; Dr. J. A. Myers, Minneapolis; Dr. E. D. Anderson, Minneapolis.
4. Discussion of the Care and Treatment of the Psychoneurotic. Dr. W. A. Jones, Minneapolis. Discussors: Dr. Arthur Sweeney, St. Paul; Dr. Frederick Moersch, Rochester.
5. Congenital Syphilis and Its Treatment. Dr. E. F. Robb, Minneapolis. Discussors: Dr. C. O. Kohlbry, Duluth; Dr. D. D. Turnacliiff, Minneapolis.
6. Phases of the Smallpox Epidemic, with Lantern Slide Demonstrations. Dr. S. E. Sweitzer, Minneapolis. Discussors: Dr. O. N. McDaniel, Minneapolis; Dr. H. E. Mickelson, Minneapolis.
7. Pathology and Diagnosis of Pulmonary Tuberculosis—Dr. Lewis Gregory Cole's (New York City) Moving Picture Film. Presented by Dr. Longstreet Taylor, St. Paul. No discussors.

WEDNESDAY, APRIL 29, 1925, 2 P. M.—

1. Public Health—A Challenge to the Medical Profession. Dr. O. E. Locken, Crookston. Discussors: Dr. C. H. Mayo, Rochester; Dr. O. W. Lindsay, Winona.
2. The Dick Test, Immunization and Treatment of Scarlet Fever. Dr. Woodard Colby, St. Paul. Discussors: Dr. E. S. Platou, Minneapolis; Dr. E. J. Huenekens, Minneapolis.
3. The Use of Novasurol as a Diuretic. Dr. Harry Oerting, St. Paul. Discussor: Dr. Norman Keith, Rochester.

4. Psychology of Compensation Neurosis. Dr. Arthur Sweeney, St. Paul. Discussors: Dr. A. S. Hamilton, Minneapolis; Dr. W. E. Hengstler, St. Paul.
5. Postoperative Pulmonary Complications. Dr. Paul G. Boman, Duluth. Discussors: Dr. H. Richardson, St. Paul; Dr. Norman Keith, Rochester.
6. Management of Toxemia Associated with Gastric Stasis, Obstructive and Non-obstructive. Dr. C. S. McVicar, Rochester. Discussors: Dr. D. C. Bal-four, Rochester; Dr. E. L. Tuohy, Duluth.
7. Causes of Death in the Fetus and Newborn; Based on 450 Necropsies. Dr. F. L. Adair, Minneapolis. Discussors: Dr. W. A. O'Brien, University of Minnesota, Minneapolis; Dr. Roger Kennedy, Rochester; Dr. J. C. Litzberg, Minneapolis.

#### SURGICAL SECTION

TUESDAY, APRIL 28, 2 P. M.—

1. Embryology of Upper Urinary Tract: Anomalies with Report of Cases. Dr. F. E. B. Foley, St. Paul.
2. Ureteral Stone. Dr. John M. Culligan, Rochester.
3. Kidney Tuberculosis. Dr. Gilbert Thomas, Minneapolis.
4. New Antiseptics, Their Value. Dr. W. F. Braasch, Rochester. Discussion to be opened by Dr. Oscar Owre, Minneapolis, and Dr. Franklin R. Wright, Minneapolis.
5. The Grading of Cancer. Dr. A. C. Broders, Rochester.
6. Cancer of the Intestinal Tract. Dr. A. C. Strachauer, Minneapolis. Discussion to be opened by Dr. C. B. Lewis, St. Cloud, and Dr. Charles Bolsta, Ortonville.
7. Tumors of the Thymus. Dr. John A. Evert, St. Paul.

WEDNESDAY, APRIL 28, 2 P. M.—

1. The Streptococcus in Its Surgical Aspects. Dr. E. C. Rosenow, Rochester.
2. The Treatment of Acute Appendicitis. Dr. Theodor Bratrud, Warren. Discussion opened by Dr. O. W. Parker, Ely.
3. Perforated Gastric and Duodenal Ulcer. Dr. J. S. Holbrook, Mankato. Discussion opened by Dr. Roland Gilmore, Bemidji.
4. Production and Healing of Peptic Ulcer—An Experimental Study. Dr. F. C. Mann, Rochester.
5. The Surgery of the Spleen. Dr. Archa Wilcox, Minneapolis.
6. The Lowering of the Mortality Rate in Toxic Adenoma of the Thyroid. Dr. T. L. Chapman, Duluth. Discussion opened by Dr. Harper Workman, Tracy.
7. Clinical and Roentgenological Differentiation of Some Apparently Similar Bone Lesions. Dr. Wallace Cole, St. Paul.

#### REPORT OF PROGRAM CLINIC WEEK DAY, APRIL 30, 1925

Anatomical Auditorium  
University of Minnesota  
8:30 A. M. AND 2 P. M.

GUSTAV SCHWYZER, M.D.

Gaither Clinic With Operated Cases and Demonstration Cases.

E. J. HUENEKENS, M.D.

The Maxillary Sinus as a Focus of Infection in Childhood; Presentation of x-rays and patients.

E. L. GARDNER, M.D.

Functional Diseases of the Colon.

W. R. MURRAY, M.D.

External Eye Diseases—Presentation of Clinical Cases and Lantern Demonstrations.

ARCHA WILCOX, M.D.

"The Acute Abdomen"—Diagnosis and Surgical Treatment Illustrated by Patients.

J. C. LITZENBERG, M.D.

Obstetrical and Gynecological Clinic.

F. C. RODDA, M.D.

A Case of Acrodynia.

J. P. SCHNEIDER, M.D.

"A Series of the More Unusual Gastro-Intestinal Lesions."

S. E. SWEITZER, M.D.

Presentation and Demonstration of Common Form of Skin Disease.

FRANK WRIGHT, M.D.

Prostatic Cases, Their Management and Treatment.

EMIL S. GEIST, M.D.

(a) Dislocation of the Carpal Semilunar Bones.

(b) Volkmann Contracture.

W. A. JONES, M.D.

Congenital Brain Defects—Demonstration Cases.

ARTHUR STRACHAUER, M.D.

Surgery of the Head.

J. FRANK CORBETT, M.D.

Neurological Surgery With Demonstrations.

R. E. FARR, M.D.

Some Phases of Plastic Surgery.

#### THE AMERICAN BOARD OF OTOLARYNGOLOGY

The American Board of Otolaryngology will hold its first examination during the meeting of the American Medical Association in Atlantic City, May 25th to 28th.

According to the rules of the Board, applicants are divided into three classes.

Class I. Those who have practiced Otolaryngology ten years or more.

Class II. Those who have practiced Otolaryngology five years and less than ten years.

Class III. Those who have practiced Otolaryngology less than five years.

The type of examination is different for each class.

The secretary, Dr. H. W. Loeb, announces that thus far over three hundred applications have been made.

#### LYMANHURST STAFF MEETING

The regular meeting of the medical staff of the Lymanhurst School for Tuberculous Children will be held in the Lymanhurst School, 1800 Chicago Avenue, Minneapolis, Tuesday evening, April 21, at 7 o'clock.

The following program will be given:

"Unsolved Problems in the Pathology and Bacteriology of Tuberculosis." Dr. H. E. Robertson, Mayo Clinic, Rochester, Minnesota.

*Motion Picture Film Demonstrating Diagnosis, Retrogression, Progression, Etc., of Tuberculosis.* This film was prepared by Dr. Cole of New York City and will be presented by Dr. H. Longstreet Taylor of St. Paul.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

#### RAMSEY COUNTY MEDICAL SOCIETY

The regular monthly meeting of the Ramsey County Medical Society was held in the Society rooms, St. Paul, February 23, 1925, the President, Dr. E. M. Hammes, in the chair.

Dr. F. C. Schuldt read a paper on "Tumors of Testis." Discussion by Dr. E. T. Bell, University of Minnesota, and Dr. Justus Ohage, Jr., and Dr. Margaret Warwick.

The second paper of the evening was read by Dr. F. E. B. Foley on "Embryology of Upper Urinary Tract, Anomalies." Discussion by Drs. Schuldt, Donohue, George Earl and Donald Bacon.

#### INTER-STATE CLINIC TOUR

The last call is being issued for the tour of the Inter-State Postgraduate Assembly clinic tour of American physicians to Canada, the British Isles and France.

The registration on March 17th was 375 physicians and a total of 625 including members of physicians' families. Forty-one states and a number of provinces of Canada are represented.

Two new one-cabin ships have been chartered, the Ansonia (Cunard line) and the Doric (White Star line).

The tour leaves Chicago, May 17th. Reservation fee of \$65.00 per person should be sent to Dr. William B. Peck, Managing Director, Freeport, Illinois.

### OF GENERAL INTEREST

Dr. Arthur Sweeney, St. Paul, has returned from Florida and has resumed his practice.

Dr. K. D. Fairley of Melbourne, Australia, spent several weeks visiting the Mayo Clinic, Rochester.

Dr. and Mrs. F. Neher, St. Paul, are receiving congratulations on the birth of a son on February 27.

Dr. C. H. Mayo spoke before the students of the medical school of the University of Iowa on Saturday, February 21.

Dr. H. C. Otto of Frazee, Minn., spent the second week of February attending Dr. Granger's lectures at the university.

Dr. J. J. Conybeare of Guy's Hospital, London, a Rockefeller Foundation Fellow, is spending several weeks at the Mayo Clinic.

Dr. and Mrs. William Lerche of St. Paul, who have been spending some time in the West Indies, will return about the first of April.

Dr. W. E. Wray of Campbell, Minn., attended the special lecture given by Dr. Granger at the university the second week in February.

The annual banquet of the Phi Rho Sigma medical fraternity will take place Saturday, April 18, at the Nicollet Hotel, Minneapolis.

Dr. Gilbert J. Thomas, Minneapolis, was elected president of the Superior Golf Club at a meeting of the board of directors held in March.

Dr. New attended the meeting of the Middle Section of the American Laryngological, Rhinological, and Otolological Society at Lafayette, Indiana.

St. Luke's Hospital, Duluth, held its monthly staff meeting on the evening of March 3. There were in attendance about fifty staff members and visitors.

Dr. H. I. Lillie attended the meeting of the Midwestern Section of the American Laryngological, Rhinological, and Otolological Society, at Colorado Springs.

Dr. J. A. Freeborn, Dr. F. Naegeli, and Dr. T. S. Paulson, all of Fergus Falls, attended the lectures in physiotherapy given at the state university last month.

Dr. Earle Page of Melbourne, Australia, Secretary of the Treasury of the Commonwealth of Australia, visited the Mayo Clinic the early part of February.

Dr. W. C. MacCarty, Rochester, has been in the South speaking before sectional meetings of the American College of Surgeons and visiting various medical colleges.

Dr. C. H. Mayo and Dr. H. S. Plummer gave the Beaumont Foundation Lectures of the Wayne County Medical Society in Detroit, Michigan, the latter part of January.

Dr. Arthur C. Strachauer gave a talk on "Cancer of the Large Bowel" before the noon-day meeting of the Hennepin County Medical Society on Wednesday, January 7th.

Dr. and Mrs. W. J. Mayo, Dr. and Mrs. D. C. Balfour, and Dr. and Mrs. J. C. Masson, and Dr. and Mrs. M. S. Henderson spent several weeks during February in Florida.

Dr. A. C. Strachauer presented a paper on "Cancer of the Oral Cavity" before the Minnesota State Dental Association, which met in the Kenwood Armory, Minneapolis, on Feb. 10, 1925.

Dr. A. W. Adson spent the early part of February in the West speaking before the Sectional meetings of the American College of Surgeons at San Diego, El Paso, and Little Rock.

The Southern Minnesota Medical Association will hold its annual meeting at Owatonna, Monday, May 18, 1925, according to an announcement made by the secretary, Dr. H. T. McGuigan.

At the annual meeting of the staff of St. Barnabas Hospital, January 4, 1925, Dr. H. C. Stuhr was elected chairman, Dr. G. L. Doxey, vice chairman, and Dr. E. W. Bedford, secretary-treasurer.

Mr. and Mrs. Russel Brown are the proud parents of a baby boy born February 21, 1925. Russel Brown is a mem-

ber of Phi Rho Sigma and is attending the medical college at the University of Minnesota.

Drs. W. F. Braasch, A. B. Moore, A. U. Desjardins, and E. S. Judd attended the meeting of the Middle Section of the American Roentgen Ray Society held in Detroit, Michigan, from February 19 to 21.

Dr. E. C. Kendall received the Chandler Medal, given annually by Columbia University for outstanding contributions to science, on February 12, when he went to New York to deliver the Chandler Lecture.

Dr. E. V. McCollum, Professor of Biochemistry in the Johns Hopkins School of Hygiene and Public Health, was in Rochester on January 13, to give a Mayo Foundation lecture on "Our Knowledge of Vitamins."

Dr. Russell M. Wilder gave the annual address of the Minnesota Pathological Society at the Institute of Anatomy, University of Minnesota, February 17. The subject of his lecture was "Studies in the Metabolism of Diabetes."

Professor E. T. Bell, of the University of Minnesota Pathological Department, gave an instructive lecture and paper before the St. Louis County Medical Society on the evening of March 12, on the general subject, "Tumors."

Dr. Martin Nordland of Minneapolis left early in March for Bern, Switzerland, where he will study thyroid diseases at the Inselspital under the direction of Dr. F. De Quervain. Dr. Nordland will remain in Switzerland for five months.

Dr. Graham Lusk of New York spent February 20 and 21 in Rochester, when he came to give the fifth of a series of lectures on nutrition under the auspices of the Mayo Foundation. His subject was "Problems of Metabolism."

Dr. Amos Leuty, also Dr. E. J. Fitzgerald, of Morris, were attendants at a week's course of lectures on Physiotherapy, delivered by Dr. Frank Granger of Harvard University, at the University of Minnesota. A total attendance of 150 physicians was reported.

Professor August von Wassermann, the originator of the Wassermann blood test, died March 16, 1925, in Berlin at the age of fifty-nine. He was director of the Kaiser Wilhelm institute for experimental therapy and professor of internal medicine at the University of Berlin.

The regular monthly meeting of the staff of Bethesda Hospital was held on February 23, Dr. K. C. Wold presiding. An excellent program was provided by the committee in charge, which included a paper by Dr. Philemon Roy on "Ectopic Gestation." A spirited general discussion followed.

Dr. H. B. Sweetser presented a paper on "Splenectomy in Purpura Hemorrhagica With Report of a Case" before the Minnesota Pathological Society at its meeting held Tuesday, March 17. "Experimental Glomerulonephritis in Monkeys" was the subject presented by Drs. E. T. Bell and B. J. Clawson.

Announcement has been made of the engagement of Miss Margaret Wellner, daughter of Dr. and Mrs. George C. Wellner, of Minneapolis, to Dr. H. W. Kohl, now of Walter

Reed Hospital, Washington, D. C. Dr. Kohl is a member of Phi Rho Sigma and graduated from the University of Minnesota medical school in December.

The University of Michigan announces a six weeks' Summer Session in Public Health which will take place from June 22 to July 31, 1925. A variety of courses of value to those interested in public health matters will be offered. These courses include general hygiene and public health, school hygiene, child hygiene, principles of public health nursing, public health administration, etc.

Articles by members of the department of pharmacology which have appeared in various scientific publications during the last ten years have been reprinted by the University of Minnesota. A hundred copies of the bulletin, called "Contributions from the Department of Pharmacology," volume I, 1914-24, are being mailed to a selected list of doctors, medical schools, pharmacologists, and others interested.

Phi Rho Sigma medical fraternity has announced the initiation of the following men, which occurred February 7, 1925: Ernest Nethercott, Christian Rohrer, John B. Beuning, Lyder L. Laugeson, L. Ray Scherer, Robert Haskin, Edwin Anderson, Joe Moen, Charles Aling, John Decker and Harry Warner. The fraternity held their quarterly dance at the Leamington Hotel, February 27, in honor of the present initiates and alumni.

St. Mary's Hospital, Duluth, held its monthly staff meeting on the evening of March 5. The meeting was held in conjunction with the Duluth Dental Society, and nearly 100, in all, were in attendance. In addition to the usual staff proceedings, Professor George Monson of Minneapolis gave a lecture, with exhibition of slides, models and specimens, on the subject, "Occlusion of Teeth and Its Relation to Normal Mastication and Deglutition."

Twenty-three of the most eminent medical and surgical specialists in London have formed a clinic at which for a fixed rate of \$75 a patient may consult any or all of them. Lord Dawson of Penn, physician to the king and prince of Wales, Sir William Lister, Sir Henry Simpson, Sir John Thompson-Walker are among the members. They have acquired a huge house in Mayfair, in the Harley street district, and have their individual offices there.

"Chest Surgery" was the subject of an address given by Dr. Carl A. Hedblom, chief of the department of surgery of the University of Wisconsin medical school, at the meeting of the Lymanhurst School staff, March 24. Dr. Ruth Boynton presented a paper entitled "Types of Tuberculosis Causing Death in Minnesota Children." Dr. E. S. Platou had chosen for his subject, "Scarlet Fever Immunity; Results With the Use of Toxin and Present Status of This Question."

St. Cloud will have a new two hundred bed hospital in the immediate future, according to announcement made recently by Sisters of the Order of St. Benedict, St. Joseph. Plans for this hospital, to cost between four and five hundred thousand dollars, are to be drawn at once, and work started on construction immediately thereafter. The hospital will be located on a tract of twenty acres of land just



north of Hester park, purchased by the Order six years ago for this purpose.

Dr. J. S. Rodman, secretary of the National Board of Medical Examiners, has announced that three additional states, Michigan, Oklahoma and Wyoming, have notified the Board that henceforth they will accept its certificate as qualifying physicians to practice medicine in those states. This makes a total of 31 states (including Minnesota) which now recognize the Board's certificate granted to candidates passing its uniform qualifying examinations, in addition to the territory of Porto Rico, the Military Reservation of the Canal Zone, and England and Scotland.

By action of the Board of Regents of the University of Minnesota, Henry F. Nachtrieb, professor of animal biology and head of the department of animal biology, and Richard O. Beard, associate professor of physiology, have been made professors emeriti. Professor Nachtrieb graduated from the University of Minnesota in 1886, and was made head of the department of animal biology the following year. He was the original organizer of the General Alumni Association of the University of Minnesota, and was its president for a number of years. He is still active in the affairs of the association as a member of the board of directors. Dr. Beard is the only remaining member of the original medical faculty. Both appointments are to take effect at the beginning of the 1925-26 school year.

To those who have been watching and have been interested in the progress of the Statute of Limitations bill through the Legislature, we are pleased to announce that this bill was passed by the Senate on March 11 without a dissenting vote. It has been recommended by the Judiciary Committee of the House for passage by that body and in order to insure its coming up during the present session and not being lost in the shuffle of last minute legislation, the Legislative Committee has succeeded in having the bill placed on Special Orders.

This looks very favorable so far and it is hard to believe this is the same bill that was killed summarily four years ago. It simply shows that the profession must be stirred up so as to take an interest in legislation and also that someone of the profession must spend his entire time looking after legislative matters. This has been done this season through the efforts of Dr. H. M. Johnson, chairman of the Legislative Committee, and his associates.

Only Russia and India surpass the United States in the number of smallpox cases in 1923, according to recent report made by a committee investigating for the League of Nations. The report was recently received by E. P. Lyon, dean of the College of Medicine, University of Minnesota. It has been commonly supposed that the United States was one of the most sanitary countries, but according to a bulletin issued by the American Association for Medical Progress the nations which have been scourged by war and disease have been able to avoid severe cases of the smallpox better than has the United States. The bulletin published by the association urges the vaccination of all people residing in the United States.—*Minnesota Daily*, March 10, 1925.

## NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

MULFORD, H. K.:

Tuberculin Intracutaneous (Human Type)—Mulford.

PARKE, DAVIS & Co.:

Mercurosal Ampules.

E. R. SQUIBB & SONS:

Squibb's Liquid Petrolatum with Agar.

**Antimony Thioglycollamide.**—The triamide of antimony thioglycollic acid. It contains not less than 30 per cent of antimony. Antimony thioglycollamide and antimony sodium thioglycollate have been tested on rats, rabbits and dogs inoculated with trypanosomiasis by Rowntree and Abel. These workers suggested the employment of these antimony compounds in the treatment of human trypanosomiasis and the larger animals. Randall has used both of these antimony compounds intravenously and intramuscularly in granuloma inguinale with marked success. In the doses employed they were less toxic than tartar emetic and the results were more favorable. From the available evidence the experimental use of these compounds in kala azar would seem to be justifiable. Hynson, Westcott & Dunning, Baltimore. (Jour. A. M. A., Feb. 7, 1925, p 441.)

**Cinchophen-B.P.C.**—A brand of cinchophen-N.N.R. For a discussion of the actions, uses and dosage, see New and Non-official Remedies, 1924, p. 93. Benzol Products Co., Newark, N. J.

**Hoyt's Protein Cereal.**—Hoyt's special gluten flour (New and Non-official Remedies, 1924, p. 195) cooked and made into flakes. Pure Gluten Food Company, Brooklyn, N. Y.

**Mercurettes-P. D. and Co.**—Briquettes, each containing finely divided metallic mercury 3.25 gm. (50 grains) incorporated with theobroma (cacao butter) and perfumed. The actions and uses of mercurettes are the same as those of ointment of mercury U.S.P. It is claimed that in the treatment of syphilis and certain forms of parasitic skin diseases where ointment of mercury has been employed, the use of mercurettes permits a more accurate dosage and is more convenient and less disagreeable. Parke, Davis and Co., Detroit.

**Tablets Iodo-Casein with Chocolate.**—Each tablet contains iodo-casein (New and Non-official Remedies, 1924, p. 156) equivalent to 0.01 gm. iodine. H. K. Mulford Co., Philadelphia. (Jour. A. M. A., Feb. 28, 1925, p. 675.)

### PROPAGANDA FOR REFORM

**Barbital and Unessential Modifications.**—The British Medical Journal discusses the multiplicity of barbituric acid hypnotics which English physicians are importuned to prescribe. In America a similar condition exists. The numerous barbital derivatives and mixtures of these with other drugs result from the fact that we have no satisfactory method of evaluating the hypnotics. Apparently the proprietary interests have taken advantage of this situation, so that the proponents of these barbital derivatives

claim various specific advantages for them. British physicians complain of the many market names for substances which have practically the same action, yet with no indication of their derivation from the original and best known drug, barbitol. In this country, the Council of Pharmacy and Chemistry provides information concerning the composition and actions of just such products. Until scientific investigators have devised a satisfactory evaluation of this class of hypnotics, it would be much more in keeping with scientific advancement were proprietary houses to refrain from putting out new derivatives, and physicians to limit their prescriptions to the two drugs, barbitol and phenobarbital—the only barbitol preparations which have been accepted for New and Non-official Remedies. The danger to the public of the use of barbitol hypnotics is of growing concern. Barbitol, itself, has been the cause of many accidental deaths, and its use is not free from addiction. In England, barbitol is included in the poison schedule and further restriction of its sale is now being considered there. (Jour. A. M. A., Feb. 7, 1925, p. 445.)

## PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

MEETING OF JAN. 14, 1925

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, January 14, 1925, at 8 p. m. The meeting was called to order by the President, Dr. Ritchie. There were 26 members present.

The minutes of the December meeting were read and approved.

There were no papers read at this meeting, but the following members reported cases:

DR. E. M. HAMMES (St. Paul) reported the following case:

Patient, boy, 15 years old. I saw him in consultation with Dr. Lepak, November 26, 1924. The family history is negative; he is the only child. He had the usual childhood diseases; pneumonia at 8; ruptured appendix, which was operated, at 11.

Following the appendectomy he became very nervous, irritable, and restless at night. About this time he developed polyuria and polydipsia. He drank as much as six quarts of water during the night and about the same during the day. His mother stated that he voids gallons of urine. A diagnosis of diabetes insipidus was made, and there were short periods of improvement, during which he would void about three quarts in 24 hours.

In June, 1924, he began to have frontal and bitemporal headaches, and these continued until September, 1924. Then he started school, he sat up late to study and his headaches became more pronounced. He complained of disturbed vision. At this time Dr. L. A. Nelson examined his eyes and found the fundi normal. The patient became more irritable and restless. He would worry constantly about his father's work and everything around the house, etc. On November 15, while out walking, he became dizzy, his feet began to drag, and he walked with a scissors-like

gait. He became rigid and unconscious. His mother, who was nearby, grabbed him so he did not fall. He soon regained consciousness and felt weak for a short while. From November 15 to November 26 he had eight similar attacks. Some of these attacks would begin by his repeating the figures 5,6,5,6 several times. Then his head would turn to the left, his eyes would close, and he would appear semi-conscious. This would subside within a few minutes. Since September, 1924, the father has noticed a marked development of pubic hairs and that the external genital organs are increasing in size. His downy mustache is becoming much heavier, and his voice deeper and coarser. Since this time the polyuria and polydipsia have become more pronounced. He had frequent vomiting spells. His thirst was excessive and painful. His eyesight failed so that he could not tell time by looking at an ordinary watch. He was unduly irritable, extremely restless, and would sleep one or two hours at night. His gait was somewhat staggering.

The neurological examination on November 26 showed that the right pupil was slightly larger than the left; his vision was poor, but response to light was normal and to accommodation sluggish. There was a general narrowing of the fields of vision. He had a marked Rhomberg to the left and backward and a tendency to fall similarly when he attempted to walk. His upper extremities were normal except for adiadokocinesis of the left hand. His lower extremities showed increased knee jerks and increased ankle jerks, a questionable Babinski on the right side. His thirst was so marked that in his hurry to drink he would spill water all over his mouth and face. His weight was 55 pounds. He had lost 21 pounds in three weeks. His spinal fluid was normal throughout except that the pressure was moderately increased. Two x-rays of the skull were negative. The sella was normal. He had quite a downy growth of hair on his face, especially his upper lip, more pronounced than the average boy of his age. His external genital organs were much larger than the average.

He was placed on one-grain doses of luminal twice a day and daily hypodermics of one-half c.c. of pituitrin. By December 17 he had gained 5 pounds in weight. His sleep was better and his nervous restlessness was subsiding. The medication was continued until January 5, when the patient complained that his breasts were enlarged and somewhat painful. His headache was returning. His sleep was poorer. His polydipsia and polyuria were more pronounced. He passed about six quarts in twenty-four hours. However, his weight gradually increased and by January 12 he weighed 72 pounds, a gain of 17 pounds.

Because of the moderately dilated right pupil, the marked polyuria and polydipsia, and the precocious sexual development, we are evidently dealing with a marked internal glandular disturbance. The picture as a whole is very suggestive of a lesion of the pineal gland, probably cystic in character, and causing some pressure in the region of the hypophysis. This would explain his polyuria and polydipsia and his improvement under pituitary extract.

DR. A. E. BENJAMIN (Minneapolis) reported two cases.

1. H. P., age 42 years, male, single, farmer. Three or

four hours after meals he is quite distressed with gas, but comfortable immediately after eating; noticeable at nights on waking. Three or four attacks of pain and vomiting during the year. Soreness near umbilicus.

Father living and well; mother died at 81 of old age. Brother living and well; two brothers died in infancy, and one of ruptured ulcer at 32 (intestinal ulcer just below stomach); three sisters living and well. One sister died of ruptured gastric ulcer at age of 49. Three or four days previous to death she visited a doctor, was operated and died within a few hours after operation.

The patient has had pneumonia, influenza, scarlatina, measles, whooping cough; as a child had peritonitis, sick four or five days, some pain and vomiting, and was out of his head.

Bowels regular, considerable distress several hours after eating; great deal of gas in stomach.

Physical examination shows some post-nasal catarrh. Sinuses and teeth healthy. Dilated and prolapsed stomach, somewhat lax abdominal muscles. Has pain upon pressure over appendix; appendiceal region very sore.

Hemoglobin, 90 per cent. Urinalysis negative. Evidence from x-ray examination (12/2/24) points to a chronic duodenal ulcer or a small diverticulum of the duodenum. The large retention indicates a partial obstruction at the pylorus.

Operative findings: Ulcer with indurated mass at pylorus 1.25 inches in diameter; anterior surface red and no adhesions except posterior surface stomach more fixed to gastro-colic omentum and one band extending to ulcer from base of gallbladder, which was normal. Appendix thickened and chronically diseased, Hard to control bleeding of gastro-enterostomy.

Operative technic: Right rectus incision. Posterior gastro-enterostomy. Pagenstecher for inside; chromic for outside; opening 3 inches long, angles and special areas supplemented by third row. Mesentery stitched to stomach around opening. Appendix removed, covering stump with mesentery of appendix. One Penrose drain; two skin, and three stay sutures; chromic for peritoneum, and posterior sheath of rectus turning it out. Chromic for fascia and skin.

Comment: This case is interesting on account of the family history. It demonstrates the advisability of not postponing the operative treatment as the last resort.

Case 2. Mrs. E. W., age 35 years, married, Scandinavian, housewife, complains of dull aching pain through pelvic region and back; no soreness of abdomen, but is constipated.

Family history: No cancer or tuberculosis in others. Father and mother living and well; three sisters living and well. Two children living, one dead from ether pneumonia. Husband living and well.

Patient has had measles, chicken-pox and mumps. No severe complications. Seven years ago had acute appendicitis with drainage. One year ago in April one-third of each tube removed.

Bowels constipated; uses mineral oil and cathartics.

Menses began at 13 years. Regular every 28 days, moderate flow, no pain.

Physical examination shows slight visceroptosis in erect position. Tenderness over lower part of scar, uterine fundus and remnants of tubes. Both ovaries enlarged and prolapsed. Fundus uteri in normal position but some increase in size. Hemoglobin 75 per cent.

Findings at operation: Rectocele; loops of small intestines and omentum adherent to whole of abdominal scar area and beyond; also in pelvis to remnant of tubes. Ovaries somewhat cystic; previous fixation of fundus.

Operation and technic: Repaired perineum. Adhesions carefully separated; raw surface covered. Remnants of both tubes dissected, out of horn of uterus; ovaries resected; round ligaments fastened over fundus, sterile vaseline on raw surfaces; three Penrose drains.

Comment: The points of interest about this case are the adhesions around the imperfectly removed tubes at former operation. If the tube is sufficiently diseased and requires its removal there is less likely to be any trouble following its removal if a portion of the tube is removed, and purse-stringing this area and covering it with the round ligaments for support, and to prevent subsequent adhesions. The second interesting point in connection with this case is the presence of adhesions in and around the peritoneal wound from the former operation.

We must endeavor to prevent these adhesions as much as possible and one definite way of obviating the condition found in this case is by turning the peritoneum outward in closing the abdomen, thereby maintaining a smooth surface within the abdomen and no raw surface or chance for the omentum to escape between the stitch line. Plain catgut may absorb too readily in some of these cases, therefore I have used a No. 0 chromic catgut double for this purpose, and in a thinned-out condition of the peritoneum the fascia above may be caught with the suture for additional support, and thereby preventing rents in the peritoneum.

DR. ARNOLD SCHWYZER reported the case of a man with arthritis of the hip on which arthroplasty had been performed.

The meeting adjourned.

JOHN E. HYNES, M.D.,  
Secretary.

#### MEETING OF FEB. 11, 1925

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 11, 1925, at 8 o'clock. The meeting was called to order by the President, Dr. Ritchie. There were 49 members and 2 visitors present.

The minutes of the January meeting were read and approved.

DR. F. R. WRIGHT (Minneapolis) gave the following case report:

About a week ago a patient came in from South Dakota. At this time he had in the right groin what at first glance appeared to be suppurating inguinal glands. On going into the history, I found that six years before this he had had an attack of pain in the side and back and was in

bed for a month. Finally an abscess formed and was drained with stab puncture near the border of the erector spinæ muscle, and this drained for about six months. Then he went to Rochester and had a complete examination, with the result that they found nothing wrong. Three years from that time he went through a similar attack and was again drained in the back. A year ago a lump appeared just below the fold of his right groin which existed for about sixty days and then opened. At the time he came to me he had two fistulæ, one exactly in the fold of the groin and one an inch and a half below it. In exploring this with an urethral bougie I found a fistula into which a bougie would go without resistance about 8 or 9 inches. An x-ray plate was made with a lead-filled bougie in the fistula which showed leading directly into the cecum.

A diagnosis was made of chronic suppurating appendix. The patient was operated the next day and the chronic appendix removed. The appendix was found retrocecal with the end attached to the fistula leading to the groin. The man made an uninterrupted recovery.

At operation, also, we found two or three spoonfuls of gelatine-like material accumulated around this inflamed appendix, evidently the inflammatory exudate, which was thickened as heavy as light gelatine or like the thick contents of an ovarian cyst.

I recall that thirty years ago, when I was an intern at St. Barnabas Hospital, Dr. J. E. Moore operated a case of chronic appendicitis where the abdomen contained a large quantity of this same gelatine-like material.

DR. R. E. FARR (Minneapolis) reported the following case:

I wish to report the case of an unmarried woman, age 36, who had an abdominal tumor for some time. A few days before she came to me, she had begun to have rather severe pain in the lower abdomen. Her temperature was normal, her pain was not so severe, and the tumor was palpable and movable. Upon opening the abdomen, it was found that she had a tumor of the left ovary which was like an hour-glass in shape, one end of the tumor being solid, the other end cystic. Each half of the tumor was about the size of an ordinary apple. The tumor was found to be twisted around its pedicle 360 degrees. This carried the meso-salpinx around the pedicle of the tumor so that the Fallopian tube completely encircled it.

The case is reported because of the rarity of ovarian fibroids (which this proved to be) and on account of the torsion of the pedicle. The patient made an uninterrupted recovery.

DR. W. A. COVENTRY (Duluth) then read his inaugural thesis, entitled "Some Observations of the Sturmdorf Operation on the Cervix Uteri."

#### DISCUSSION

DR. LITZENBERG: Sturmdorf brought out his operation really in competition to the Schröder amputation technic. It is a decided improvement on the Schröder operation in certain types of cases. However, I think the usually advocated indications for the operation are too broad. We find

at the University Hospital that we still get better results from the Schröder technic in deeply lacerated cervixes. However, as Dr. Coventry says, we find that hypertrophy of the cervix with numerous Nabothian cysts is the typical cervix for the Sturmdorf operation. Sturmdorf claims that more tissue can be removed than by the Schröder. I doubt that; but that it can be better removed in certain cases, I have no doubt.

In most of the cases we use a glass stem pessary to avoid complications which Dr. Coventry mentioned. We do not sew it in; we do not believe in leaving it in for a long time. We simply insert it, letting it come out in a short time. In this way there is no danger of stenosis of the cervix.

I still think that both operations have their place: the Schröder being preferred when the cervix is deeply lacerated, and the Sturmdorf in all other cases.

DR. WRIGHT: I want to say one word in regard to silkworm gut used in the cervix. Where it is not satisfactory, or is lost, that is due to technical error on the part of the surgeon or assistant; if the ends are pulled out and cut two inches long they are easily found and you will not lose them.

DR. BENJAMIN: I was pleased, indeed, to hear this paper. Dr. Coventry has brought out several valuable points. A number of years ago when Schröder brought out his operation, we were using silkworm gut, and once in a while we lost the suture. I devised an instrument to obviate this possibility with which we could always get the suture. This was a scissors with a clamp on the side of it, and a hook on the end of it. With this instrument we could hook up the suture, cut and clamp the suture, and pull it out at the same time.

The instrument was an expensive one, costing about \$20, so that when catgut came into vogue, we discarded the instrument and used chromic gut instead.

There are a few things about the technic that I wish to mention. Personally, I use a combined Schröder and Sturmdorf operation. Very often we find a great deal of scar tissue extending up into the canal. Many of these patients will have dysmenorrhea who never experienced it before having children. If we take out too little scar tissue, dysmenorrhea will still be present. It has been my custom to extend the incision in these cases up on the side of the cervix and remove the scar tissue to the internal os. In this way we get a soft cervix that yields. In these cases, I place a soft rubber tube in the cervix that prevents stenosis. We find it better than the stem pessary. The results are very satisfactory.

When the cervix is particularly diseased or infected, we treat these cases before operation as Dr. Coventry does.

DR. ROTHROCK: I have had no experience with this operation. I still use the Schröder, with very satisfactory results.

DR. E. L. TUOHY (Duluth) read a paper entitled "The Twilight Zone of Pathology and Clinical Medicine."

#### DISCUSSION

DR. A. SCHWYZER: It is rather difficult to discuss this subject in detail as there are so many individual items, but



the point Dr. Tuohy apparently wanted to make is, that without communicating or working with the clinical man, the pathologist is liable to go astray; but still more so, the clinical man will get into off-roads if he does not constantly consult the pathologist. It is even better if he is something of a pathologist himself and if he has an exact understanding of the anatomical (and physiological) presentation of the case and the particular organ under question. We clinical men must try to keep in touch with the pathologist, and not only that, but we must try to do as much pathology as we possibly can ourselves.

The time spent at the autopsy table and behind the microscope will keep the medical student from falling behind later and will help him keep step in the forward march of our science.

The doctor told us some things about goiter. I must confess that I do not agree with him there. We are not so much at sea about this subject as he puts it. In examining the goiter slides of our operative cases, I do not allow the pathologist to tell me which case it is. I always try to make out from the microscopic picture which one of three or four cases this may be. In the great majority of cases you have a pretty good idea of how toxic the case was when you examine the slides, if you do not confine yourself to one section. On the average we can pretty well say whether we have a very toxic goiter or a moderately toxic one, or whether we have an indolent form.

The first picture which Dr. Tuohy showed was a toxic goiter with large colloid follicles and only small scattered areas of nests of increased activity. In Switzerland, where we have so many large goiters, one frequently sees a very large goiter which later on becomes toxic. The toxic areas may be hidden in the bulk of the goiter and you may not detect them if you have not sections of different portions. The impression received from Dr. Tuohy's paper was that we still have a great incongruence between the clinical and the anatomical picture in the goiters. After so much splendid work has been done on goiter I do not like to feel that we are still so very much at sea.

Of late years the clinical men have done much in the field of pathology themselves. Let me just mention one example in relation to Dr. Tuohy's case of small abscesses in the liver with cholecystitis. Gundermann, in Poppert's clinic in Giesen, Germany, published over 200 cases of bacteriologically studied cholecystitis. Far away from the gallbladder he took small slices of liver tissue (similar to Graham's work) and in three-fourths of the cases he found bacteria in them and saw the small bile channels surrounded by infiltration. So that, in an outspoken cholecystitis, we have to figure with a cholangitis and a cholangiolitis. Thus Dr. Tuohy's case is not so much of a surprise any more.

Of course, there are a good many cases, like brain cases, where the clinical picture may be so much more outspoken and where the pathological findings are so small. It is often unfair to demand from the pathologist a definite finding at the present state of our knowledge.

I would like to mention an instance where the clinical findings widely differed from the report of the pathologist and which also shows how we have to work together. Many years ago, when I was still an assistant, a case was brought into our hospital and I was supposed to examine her. She

came for profuse bleeding and I curetted her. I told the Professor that we had a carcinoma of the corpus uteri. Specimens were sent over to the pathological laboratory and the laboratory sent back a report which amazed me—that the case was benign. I insisted that it was carcinoma just the same. The Professor looked at me as though he thought I was a young assistant who had too much to say. I told him, "If you put the curette into the uterus you will agree with me that it is carcinoma." He scooped out some whitish chunks. It was one of those cases of carcinoma, also called adenoma destruens.

The pathologist had not known his section went so deep into the tissues. It all goes to show that sane clinical work and pathology can not be separated, and the more a student uses the microscope and learns pathology, the broader is the foundation upon which he can build in his clinical work; and without it, the structure will remain shaky.

DR. GILFILLAN: This is one of the most interesting and instructive papers that I have heard for a long time and it is too bad that we do not have more along this line. I think probably the difficulty is too much specialism. It reminds me of the young man who got to be very narrow in his specialty and Dr. Tuohy advised him to take only one side of the nose and specialize on that. That is what we are all doing. Pathology is not such a little thing that it ought to be done only on dead bodies or on excised tissue. Pathology is physiology as well as anatomy. It is a study of tissues in the living as well as in the dead, but we split it in two. For instance, the pathologist reports that a patient died of fibroid heart. The question is, "How sick would that make him?" The day before, the patient had swallowed 7 grains of morphin and the doctor thought that was what killed him, but the pathologist did not know that. Many things have no anatomic pathology so far as we know. Epilepsy and migraine, for instance, are pathology quite definitely. The person who has them thinks so; but still in the deadhouse they do not make much of an impression.

Dr. Tuohy's idea is a correct one; if we have two people, one to do the clinical cases and one to do the dead, pathology is by no means complete. We are splitting it in two and not getting the halves together at all.

The clinician looks at the pathologist a good deal as he does at the Diet; that his judgments in all things are infallible, and forgets that the pathologists are human. A good pathologist tells us less than a poor one does. Some go so far even as to say they will not diagnose sarcoma from the microscopic slide.

So with many of these sections, and especially perhaps on the lymphatic things, we are way up in the air. We clinicians cannot get very far because the pathologist has not got very far. When we see a case under the microscope we can't tell about the clinical course. Some things must be diagnosed on a clinical basis, on the basis of symptoms without any great respect for what they look like under the microscope.

I recall one writer who spoke of the difference between broncho and lobar pneumonia. He said it was not the province of internal medicine to set up a classification of disease which could only be proven post-mortem; that we must make one which agrees with the clinical symptoms. We must make the diagnosis when the patient is alive.

DR. TUOHY (closing): I have not much to add except that I want to thank the gentlemen for their discussions. I feel amply repaid for the study by these discussions. I apologize, however, for keeping you so long.

The features I have been discussing most notably—these gland situations, pernicious anemia, leukemia, and Hodgkin's disease—the course of the disease makes the diagnosis, and obviously we can't entirely envision the whole complex by any clinical or anatomical estimate made at any one period, particularly before the full picture is arrived at.

As far as Dr. Schwyzer's discussion is concerned, I may say it is something on the order of the famous French obstetrician who went to Germany. When he came back he was asked, "What is the most remarkable thing you heard of over in Germany?" "I heard Prof. 'so-and-so' say that he is able with an instrument he has devised to hear the fetus cry." The obstetrician was asked, "But do you believe that?" He replied, "Coming from such a distinguished authority, I do; if I had heard it myself I would not have believed it."

The meeting adjourned.

JOHN E. HYNES, M.D.,  
Secretary.

## CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

### PREGNANCY WITH COMPLICATIONS: PLACENTA PREVIA; HYDATIFORM MOLE— A CASE REPORT

DANIEL H. BESSESEN, M.D.  
Minneapolis, Minn.

This patient, aged 24, a primipara, when seen first on July 12, 1923, gave a history of menstruating last in April, but with a slight showing with vomiting on June 2 and again on June 16. These bleeding spells had been attended with slightly crampy pains in the abdomen. Otherwise the history was entirely negative and she showed on examination evidence of a 3.5 months' pregnancy with good health. The progress of gestation was uneventful until she was admitted to the hospital on the 8th of October, with bleeding on slight effort. The patient was kept to her bed with morphin and atropin and after a week was dismissed again from the hospital. On November 3 she was once more removed to the hospital and the vagina packed. The diagnosis of placenta previa was made at this time and on the following day a Barnes bag was inserted and filled to capacity. The placenta was delivered and after this a large multicystic hydatiform mole with a well developed cord. All the pieces were expressed, an intrauterine douche of

potassium permanganate 1-6000 given and the small tear in the uterus repaired with chromic gut. Recovery was entirely normal and the patient left the hospital on the 14th day post delivery. Placenta previa is almost always indicated by hemorrhage from the vagina in the latter months of pregnancy. These patients may feel no pain or other untoward sensation from the heavy bleeding resulting from the misplacement of the placenta and death is known to occur during sleep from this cause without arousing the victim. The packing of the vagina or the insertion of a bag into the uterus are the surest procedures to check the hemorrhage. In cases where it is possible to carry pregnancy closer to term, the insertion of the bag may be left to a later date.

Hydatiform mole is usually distinguished by the escape from the vagina of the small grape-like vesicles characteristic of the condition and also by the increase in the size of the uterus to larger than is normal for the corresponding period of gestation. Neither of these diagnostic points were present in this case. The placental insertion over the exit of the uterus prevented the escape of the vesicles, and the uterus was the size of normal pregnancy throughout gestation. The mother stated that she had distinctly felt life at the usual time, and though no fetal heart sounds were heard and no definite fetal form was palpated, the diagnosis of pregnancy was not controverted until the time of delivery.

These hydatiform moles become malignant chorio-epitheliomata in from 25 to 33 per cent, according to various writers, and this change may occur up to 13 years following delivery.

## PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

## MEDICINE

### SUPERVISORS:

F. J. HIRSCHBOECK,  
FIDELITY BLDG., DULUTH

THOMAS A. PEPPARD,  
LA SALLE BLDG., MINNEAPOLIS

TUBERCULOUS ENTERITIS: Gerald B. Webb, M.D. and G. Burton Gilbert, M.D. (National Tuberculosis Association, Transactions, 1924). Tuberculous enteritis frequently occurs even in relatively early pulmonary cases. This complication can creep upon the scene in a most insidious manner. Physicians who wait for the appearance

of such classical symptoms as persistent diarrhea, abdominal pain, tenderness, rigidity or local thickening before making a diagnosis of tuberculosis of the intestinal tract will see only late cases with a relatively bad prognosis. The writers have learned to suspect a beginning tuberculous enteritis whenever patients complain of slight persistent nausea, anorexia, a feeling of discomfort after eating, undue nervousness, constipation and gaseous indigestion.

The x-ray has been of very great assistance in diagnosing early cases. Both a test meal and an enema should be given, following the technique devised by Brown and Sampson.

Time and experience have developed no more important remedy than rest. Granted, however, that we cannot produce any absolute functional rest for the diseased intestine, we can at least do the next best thing by putting the patient at rest in bed and reducing the work of the intestines to a minimum. Exercise not only increases the amount of nourishment required to keep the body in equilibrium but also stimulates peristalsis.

A patient at rest often can gain weight on a relatively low caloric intake. During rest all food given can be assimilated more easily. The one food requiring the least expenditure of digestive energy is milk. In short, milk in small doses taken often, say three or four ounces every waking hour, is the ideal diet for the ulcerative cases. Not all patients can take milk, but many can who think and say they cannot. This is true when they are properly encouraged, especially if the milk is modified by the addition of citrate, or lime water, or slightly flavored to suit the individual taste, or started with teaspoonful doses. If the patient is unable to gain weight, we give an ounce of cream with three ounces of milk; and, often, three or four ounces of equal portions of milk and cream are very efficacious. This addition of cream is also of value where there is a tendency to constipation. In obstinately constipated cases it may be necessary to give a little mineral oil. Many patients after a short time are allowed three or four small meals daily to take the place of three or four of the hourly feedings. The meals should not exceed six ounces. Not infrequently it is wise before starting this regime to empty thoroughly the intestinal tract by giving a minimal dose of calomel followed by a small dose of castor oil. When diarrhea is present no calomel should be given but the castor oil need not be omitted. A complete fast of a day or two, where the patients are in good general condition, is of decided value. In the rare cases where milk actually disagrees one may give other bland foods, especially proteins, in small doses at frequent intervals.

In general little medication is necessary but occasionally calcium and bismuth powders are very soothing. Applications of moist heat to the abdomen are apparently of some value in painful cases. Opium is reserved for those cases in which all other measures fail. Phototherapy is worthy of an extended trial in all cases, unless it be those with high fever and much prostration.

ARTHUR T. LAIRD, M.D.

**ABSTRACT—THE CONTRALATERAL LUNG IN PULMONARY TUBERCULOSIS TREATED BY ARTIFICIAL PNEUMOTHORAX:** R. W. Matson, R. C. Matson and M. Bisaillon (*American Review of Tuberculosis*, 1925, x, 562). End results of pneumothorax are associated with the behavior of the opposite lung and deductions as to prognosis are based on the following classifications:

1. Essentially negative. It is often difficult, if not impossible, to demonstrate hidden foci in the contralateral lung.
2. The peribronchial type of tuberculosis by itself does not require great consideration so long as it remains confined to the peribronchial structures, but these are not always benign and there is a tendency to invasion of the lung parenchyma.
3. Disseminated bronchogenic caseous extensions occur as a result of the aspiration of bacilli-laden sputum into the contralateral lung, usually taking place in the dependent portion or the pre-hilar region.
- 4 and 5. Active and quiescent fibro-caseous infiltrations usually occur in the upper half of the lung and are recognized by the usual physical diagnostic signs.

Not infrequently excellent results leading to complete recovery can be obtained even in the presence of extensive disease in the opposite lung. These results depend on the character of the collapse, flexibility of the mediastinum and type of opposite lung lesion. The diseased lung varies greatly to the reaction of the collapse of the other lung. Fibro-caseous lesions in the apex are more favorable than lesions around the root of the lung.

Fluoroscopic examination before each inflation should be practised. During the early stages it is imperative to resort to the fluoroscope more frequently in order to determine the proper interval for inflation. One should not depend solely upon manometric pressure reading and physical findings to determine the character of the collapse.

Febrile reaction following inflation in the presence of a satisfactory collapse suggests activity in the opposite lung.

Of 480 cases hemoptysis was present previous to pneumothorax treatment in 82, but after treatment occurred in only 10 cases. Progression of the disease in the opposite lung brings up the question of re-expansion of the collapsed lung with collapse of the contralateral lung, but prognosis in cases so severe as to demand a bilateral pneumothorax is not good although the treatment will often add to the comfort and prolongation of life.

The end results in pneumothorax treatment depend less on the contralateral lung than on the character of the collapse and type of the disease in the more involved lung. The contralateral lung when diseased should always be suspected when unfavorable symptoms arise. In this series, in the presence of satisfactory collapse of the more diseased lung, results were much better with any type of contralateral lung lesion than those of the "no free pleural space" cases, with an essentially negative contralateral lung.

N. BLAKIE, M.D.

## SURGERY

### SUPERVISORS:

DONALD K. BACON,  
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,  
MAYO CLINIC, ROCHESTER

**RUPTURE OF THE DIAPHRAGM:** Amos O. Koontz, M.D. (*Annals of Surgery*, lxxx, 1924, 898-907). The literature of diaphragmatic rupture is rather carefully considered in this article. Diaphragmatic hernias are of the false type in ninety per cent of the cases, only ten per cent having a sac. Hernias of the diaphragm are either congenital or traumatic in origin. Ninety-two per cent occur on the left side and the reasons offered for this are as follows: 1. The liver acts as a buffer on the right side. 2. Stabs and shots are more frequently met with on the left side. 3. Embryologically, the posterior portion of the left side of the diaphragm is the last portion to become closed.

The majority of congenital cases are not diagnosed unless by accident or at autopsy. On the other hand, traumatic cases are far less difficult to discover. The author reports a case of traumatic diaphragmatic hernia in detail, giving the post-mortem findings. Careful history, x-ray, and, if necessary, exploratory puncture of the chest, aid materially in diagnosing this uncommon condition. Surgery is advocated where symptoms of obstruction or rupture of the diaphragm are in evidence. Of two approaches the author believes the thoracic route more advantageous than the abdominal.

JACKSON K. HOLLOWAY, M.D.

**JACK-KNIFE POSITION AFTER HERNIA OPERATIONS:** Leigh F. Watson (*Annals of Surgery*, Aug., 1924, lxxx, pp. 239-241). The posture of the patient after an operation for hernia is usually neglected. If surgeons realized that they could reduce their recurrences materially, besides adding to the comfort of their patients, the jack-knife position would become a matter of routine for inguinal, femoral, umbilical and ventral hernias which present difficulties in closing the fascial layers.

In inguinal hernia operations the best exposure is obtained by keeping the thigh extended until the deep sutures are ready to be tied, when it should be elevated, adducted and rotated inward. This reduces the distance between Poupart's ligament, the internal oblique and conjoined tendon, from 25 to 50 per cent, depending on the size of the opening, the variety of hernia, and the development of the muscles. After the patient is returned to bed his knees and shoulders should be elevated 25 to 45 degrees by means of pillows and a back rest. This position takes the strain off of the stitches during the process of repair, permits a broad, firm union of fascial flaps, and reduces the percentage of recurrences. The jack-knife posture should be maintained as long as the patient stays in bed.

**THE TREATMENT OF BRAIN ABSCESS BY UN-ROOFING AND TEMPORARY HERNIATION OF ABSCESS CAVITY WITH THE AVOIDANCE OF USUAL DRAINAGE METHODS:** Joseph E. J. King, M.S., M.D., New York (*S. G. O.*, Nov., 1924). King briefly reviews the methods heretofore used in the treatment of brain abscess which attempt three basic procedures:

1. The drainage of the abscess cavity;
2. Prevention of extension of meningeal infection;
3. Prevention of hernia cerebri.

In cases so treated there is always trouble caused by failure or dislodgment of drains. Secondary abscesses are of common occurrence and are difficult to drain, frequently causing death by rupture into the ventricle.

The author describes several cases where herniation of the brain through the craniotomy opening occurred. This causes the abscess cavity to become very shallow and eventually to become merely a flattened, cup-shaped area which quickly granulates over and recedes into the skull.

Recently, King has carried out his operative procedures with the intention of starting this sequence of events and finds his results to be far superior to those obtained in cases where herniation is prevented.

The operation is performed by making a trephine opening over the abscess, which is then definitely located by aspiration with a needle and syringe. The opening in the skull is then enlarged by rongeur forceps in whatever direction is necessary to completely unroof the cavity. The dura is opened by a stellate incision to create six pointed flaps which are pulled back around the bony margin and sutured to the scalp flaps. Small pieces of iodoform gauze are then lightly packed between the dura and cerebral cortex to prevent extension of infection; if adhesions exist, so much the better. The abscess is then opened and the overhanging cortical tissue excised, leaving a large opening into the cavity, which is irrigated with Dakin's solution and wiped out with cotton pledgets. If the abscess has a capsule it is not disturbed, as it tends to prevent too marked herniation of the brain.

By twenty-four hours after the operation the cavity will have become much more shallow and may have reached the level of the inner table of the skull. This protrusion increases daily until about the sixth post-operative day, when there is a large mushroom shaped mass outside the skull and the abscess cavity has become completely everted. This mass must not be cut away but must at all times be carefully protected from pressure and trauma. Lumbar puncture may be used to relieve pressure which would otherwise cause excessive size of the hernia. After three or four weeks the surface of the hernia will become covered with healthy red granulations and the size of the mass will become less day by day. The epithelium of the skin will also commence to creep over the mass. At this stage of affairs the skin margins may be pulled together by adhesive straps which exert slight pressure on the hernia. For the mass to entirely recede within the skull, and for epithelium to cover the area, will require two and one-half to three months.

DONALD K. BACON, M.D.



**ACUTE PANCREATITIS:** Sir Berkeley Moynihan (*Annals of Surgery*, vol. lxxxi, January, 1925, No. 1, pp. 132-142). There are three types of acute pancreatitis—hemorrhagic, gangrenous, and suppurative—varying only in degree.

Diagnosis should be easy if one only thinks of it. The symptoms are pain after a big meal, intense in the epigastrium and often in the back and both loins, profound collapse, and rapidly rising pulse with a blood pressure fall. The patient is pale, the limbs and face are cold, and death seems imminent. Vomiting, retching, hiccough are frequently present. "The face is livid, and patches of a slate-blue color may be distributed irregularly over the surface of the abdomen or even the limbs. This cyanosis is never found in other forms of acute abdominal catastrophe, so far as I know. It is not always present in acute pancreatitis, but if it is found, it is, I believe, an undeniable evidence of acute pancreatic disease." The abdomen is rigid but not to the extent seen in perforation of a viscus. The rigidity is mostly above the umbilicus, as is the tenderness. "The essential quality of the disease is auto-digestion of the pancreas and that can rapidly occur only through an invasion of the duct."

Operation in these cases should be the treatment of choice, even though in rare instances a case has recovered spontaneously.

The operative treatment consists in drainage of the pancreas, which is sometimes reached above the stomach, through the gastrohepatic omentum, sometimes below the greater curvature through the gastrocolic omentum, and occasionally through the transverse mesocolon after the omentum has been turned upward. Great care should be exercised in aspirating and walling off any free fluid about the pancreas because it is very toxic. The gland itself need never be incised, but a finger can be insinuated into it to allow free drainage. Drainage is usually through the abdominal wall anteriorly, but in some cases, posterior drainage is established. The main aim is to have the drainage free. A coexisting gall-bladder involvement should be either left alone or handled in the most conservative way, depending upon the general condition of the patient.

WILLIAM P. HERBST, M.D.

**CONGENITAL ABSENCE OF THE UTERUS:** L. R. Wharton, M. D. (*Surgery, Gynecology and Obstetrics*, Jan., 1925). Doctor Wharton describes a specimen and points out the necessity of investigating the urinary tract in cases of mal-formed genital tract. This is important, as deformity in one is often associated with deformity in the other.

J. C. POTTER, M.D.

**THE PLACE OF ELECTIVE VEIN LIGATION IN BLOOD VESSEL SURGERY:** R. W. McMaly, M.D. (*Surgery, Gynecology and Obstetrics*, January, 1925). It is pointed out in this article that in sudden occlusion of the main artery simultaneous occlusion of the vein is indicated.

J. C. POTTER, M.D.

**UNRECOGNIZED HEMORRHAGE WITHIN THE UPPER LEG RESULTING FATALLY:** Charles L. Larkin, M.D., Waterbury, Conn. (*S. G. O.*, Nov., 1924). The author calls attention to a definite traumatic condition, *i. e.*, hemorrhage within the upper leg which may go unrecognized and result fatally.

This is in contradistinction to the traumatic injuries to the upper leg which go on to the formation of hematomata.

This article shows that either oozing or a swift outpouring of blood after injury may go far beyond hematoma formation and, following the muscle sheaths and fascial planes, result in death.

Four cases are reported: one a stab wound of the groin; one a muscle tear of the sartorius and adductor muscles, and lastly, two fractures of the femur with muscle laceration.

In each instance, the original injury was followed by shock and collapse, the severity of which seemed entirely out of proportion to the original injury. Additional findings which might indicate the actual condition were first an enlargement of the thigh on the affected side which might cause an increase of two to three inches in the circumference. In several of the cases a bluish discoloration could be seen in Scarpa's triangle and a fluid wave could be demonstrated by percussion and palpation.

On dissection of the upper leg at necropsy, large amounts of blood were found in the muscle sheaths and along fascial planes; in several of the cases as much as two liters was present.

The author believes that this complication is sometimes present but unrecognized in fracture of the femur and that it may be responsible for the severe shock seen in some cases.

DONALD K. BACON, M.D.

**THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS BY THORACOPLASTIC COLLAPSE:** Aduan V. S. Lambert and James Alexander Miller (*American Review of Tuberculosis*, 1924, x, 9). The authors of this article report the results of their experience in the treatment of 20 cases during the past two and a half years by the Sauerbruch operation. Three died at operation, three more died later, 14 were cured or greatly improved. They believe that the present mortality of approximately 25 per cent may be reduced by more skillful selection of cases and improvement in technique and that approximately 50 per cent of cases can even at the present time be returned to a satisfactory degree of health. They favor the two stage operation for practically all cases. Prolonged after-treatment and close co-operation between the physician and the surgeon is necessary. The physician should be thoroughly familiar with the modern treatment of tuberculosis and experienced in it. The problem of surgical treatment is very closely associated with and bound up with the problem of treatment with artificial pneumothorax. In general suitable cases should have predominantly unilateral lesions. Lesions of the central and lower portions of the opposite lung usually preclude operation.

A. T. LAIRD, M.D.

**EARLY RECOGNITION OF GASTRIC ULCER:** Vaughan and Brams (Surgery, Gynecology and Obstetrics, Nov., 1924). The author reports a series of fifteen proven cases of acute perforation of gastric and duodenal ulcer in which x-ray examinations have been made before operation to determine the presence of gas in the peritoneal cavity. In all instances the x-ray was taken as early as possible after admission, in some as early as two or three hours after perforation occurred, and the x-ray evidence was checked up in all the cases by immediate operation.

The presence of free air in the peritoneal cavity is demonstrated by observing a clear, distinctly bright zone which shifts on change of posture of the patient. The outline of the gas bubble will be determined by its location and the nature of the structures which limit it. The most typical picture is seen when the patient is in the upright position, the narrow sickle shaped zone of air situated most frequently just under the right cupola of the diaphragm being the most characteristic sign. The gas bubble will seldom be confused with other things because of its sickle shape and the fact that it is very bright and distinct with no mottling of its body, and the boundaries are usually regular and constant in configuration. It is not essential to have the patient in the upright position, as a sufficiently characteristic picture may be obtained by placing the patient on his left side and observing the air bubble between the external abdominal wall and lateral surface of the liver. The entire procedure may be performed with the fluoroscopic screen, no preliminary preparation being necessary.

Thirteen of the fifteen cases reported by the author showed the presence of free air in the peritoneal cavity. This sign used in combination with other signs and symptoms is a valuable addition to the clinical syndrome produced by acute perforation of gastric or duodenal ulcer because it makes possible an early and definite diagnosis without danger or discomfort to the patient.

J. W. STINSON, M.D.

**POSTOPERATIVE LEUKOCYTOSIS:** Dr. Witter (Surgery, Gynecology and Obstetrics, January, 1925). There is a postoperative leukocytosis following operation which appears before the febrile reaction. In a general way the leukocyte and temperature curves run parallel. The leukocyte curve reaches its height by the fourth hour and is normal by the fifth day. It is mainly a polymorphonuclear increase.

J. C. POTTER, M.D.

**THE TREATMENT OF ABORTION:** H. K. Tuttle, M.D. (Surgery, Gynecology and Obstetrics, January, 1925). In cases of retained membranes, sepsis, or boggy bleeding uteri, prompt emptying of the uterus and packing are the general principles best followed. Attention is called to the control of the hemorrhage by packing, especially in those cases which pass clots occasionally but otherwise show little external bleeding. The usual complete abortion requires little beyond rest, pituitrin, and ergot.

J. C. POTTER, M.D.

**THE EFFECT OF SURGICAL TRAUMA IN PATIENTS WITH SYPHILIS, WITH SPECIAL REFERENCE TO HEALING OF THE POSTOPERATIVE WOUND:** W. H. Goeckerman, M.D. (Surgery, Gynecology and Obstetrics, January, 1925). It is pointed out that in general the patient with syphilis is no greater surgical risk than any other. This applies to treated and untreated cases. The exception to this is the group of long standing luetic cases which show cardiovascular and neurological changes.

J. C. POTTER, M.D.

**TREATMENT OF PULMONARY TUBERCULOSIS WITH THE HELP OF ARTIFICIAL PNEUMOTHORAX:** Sidney F. Blanchet, M.D. (Archives of Surgery, January, 1925, Part ii). Treatment of pulmonary tuberculosis by compression of the diseased lung by artificial pneumothorax has been on trial for over thirty years. The author has made use of this procedure since 1911 and cites 200 cases treated between 1911 and 1922.

In a series of 2,000 cases seen, he felt that this method of treatment was justified in 200 cases, or 10 per cent. These cases were placed in one of two groups:

1. Early or moderately advanced cases.
2. Later or advanced cases.

Ninety-seven of the cases done in the ten years which were in Group II are dead. Twenty-four of the Group I cases are dead. In Group I, six failed to show improvement; 23 were decidedly improved; 29 were able to work.

Influenced by his own statistics the author concludes that lasting results by means of artificial pneumothorax in advanced cases are negative. In moderately advanced cases failing to respond to other forms of treatment, a fairly high percentage of success may be expected from artificial pneumothorax. A feature which predisposes to failure of this treatment is adhesions preventing complete compression. The artificial pneumothorax tends to arrest progressive lesions and to control or prevent recurrence of hemoptosis.

Sanatorium regime is essential along with the artificial pneumothorax if one is to get best results.

If after two or three years the advisability of letting the lung expand is doubted, one may go ahead with a thoracoplasty and produce permanent compression, as compression by artificial pneumothorax for a longer period may predispose to purulent effusion or perforation of the lung.

Artificial pneumothorax has won for itself a definite place in the treatment of pulmonary tuberculosis.

L. D. POWELL, M.D.

**Gomenol.**—Gomenol is a volatile oil obtained from a plant related to the plant that yields oil of cajuput. It is very similar to oil of cajuput and its therapeutic properties probably are also like it. Gomenol comes as a proprietary from France and it is exploited under extravagant claims. (Journal A. M. A., Oct. 18, 1924, p. 1264.)

## PEDIATRICS

## SUPERVISORS:

CHESTER A. STEWART,  
LA SALLE BLDG., MINNEAPOLIS  
ROY N. ANDREWS,  
MANKATO CLINIC, MANKATO

THE VALUE OF THE CONVALESCENT HOME IN THE MANAGEMENT OF CHOREA MINOR: Harold K. Faber, M.D., and Anna F. Barnett, M.D. (*Archives of Pediatrics*, January, 1925). Fowler's solution and salicylates have been used for many years, with unconvincing evidence of benefit. Chorea runs a largely unpredictable course, even in the absence of therapy. While it is but fair to admit that shock, such as follows the intraspinal or intravenous injection of various substances, particularly proteins, not uncommonly brings about a period of quiescence in chorea of varying duration, and that sedative drugs, such as luminal or magnesium sulphate, have a definite quieting action, the pathology of the disease does not allow us to suppose that such measures can have any but the most indirect curative effect.

The primary need of the choreic is rest. Rest is essentially dependent on quiet, and the maximum of quiet is unobtainable in town, where noise is practically incessant. The country has another advantage over town in being able to offer a great accessibility to sunlight. While the systemic effects of sunlight are still little understood, it may at least be stated that heliotherapy has important beneficial effects on the body which increases its resisting powers against infectious disease, promotes certain metabolic processes, including growth, normal bone formation, and the healing of wounds, and increases blood regeneration. With the establishment of the Kate D. McLaughlin Unit of the Stanford Convalescent Home it was for the first time possible to send to the country early convalescents and other children still, for one reason or another, in need of bed rest and a certain amount of nursing care. The diet is abundant and well balanced, with emphasis on milk, fresh fruits, green vegetables. Graduated heliotherapy by a slightly modified Rollier schedule is given in the morning hours. Twelve hours' sleep during the night and a two-hour afternoon nap are assumed.

In general, it is clear that, as compared with experience in home or hospital treatment, the hygienic, or expectant, treatment of chorea in a convalescent home with facilities for continued bed rest and isolation, if it is needed, can usually be relied upon for recovery. The facilities of the convalescent home allow bed rest with nursing care until symptoms have entirely subsided—a period of four to ten weeks in severe cases—and a further period of ambulatory care with the patient still under supervision, during which he can regain his full strength. The maintenance of nutrition and the insistence on liberal periods of sleep and rest are of the utmost importance.

R. N. ANDREWS, M.D.,

BERTRAG ZUR GOLDLICHHANDLUNG DER TUBERKULOSE: L. Richman, Munich Med. Wochenschr., Nr. 46, Nov. 1924. 71 Jahrgang. In 1890 Robert Koch demonstrated the inhibitory effect of potassium gold cyanide on the growth of the tubercle bacilli. Feldt later made numerous culture experiments and demonstrated that this effect came from the gold component and proved that colloidal gold prevented growth in a dilution of 1 to 1,000,000, while potassium cyanide inhibited growth in a dilution of 1 to 1,000. He also showed that Aurocantan was one-half as toxic as potassium gold cyanide and, therefore, was tolerated in twice the dose. Gold compounds were effective only in case the metal was available in colloidal solution. Another substance, Krysolgan, is only one-sixth as toxic as Aurocantan, but the injurious effects in man from its use have made physicians skeptical about its value. Through findings that smaller doses of Krysolgan influence tubercles as favorably as larger doses, the complications resulting from its use in form of toxicodermias, gastric disturbances and other symptoms may be reduced to a minimum. The gold preparation Triphal has properties similar to those of Krysolgan but is definitely less toxic. It differs chemically from Krysolgan in that it is a more stable compound. In the former gold is more easily split off.

No injurious effects have been experienced to date after four years' use of Triphal. Very small doses stimulate connective tissue development and hasten healing processes, a fact which has been noted in frequent examinations of the larynx.

Gold therapy is indicated especially in lesions where there is a tendency toward connective tissue development, that is, when the process is largely productive. In destructive processes it is not so satisfactory, for reactions occur very easily with wider spreading of the tuberculous process. The slowly progressive cases are most suitable for treatment as are also stationary or retrogressive cases. The gold therapy is indicated in laryngeal and pulmonary tuberculosis in the absence of acute progressive lesions.

Other authors are of the opinion that gold therapy is of value in skin, bone and joint tuberculosis.

C. A. STEWART, M.D.

IGNORANCE AND NEGLIGENCE AS FACTORS IN DEATHS FROM DIPHTHERIA: E. C. Fleischner, M.D., and E. B. Shaw, M.D. (*Archives of Pediatrics*, January, 1925). Can pediatrics justify the ignorance responsible for the tremendous ravages of diphtheria? The honest attitude of the medical man toward his patient should be a definite one. If he does not know what the trouble is, he should know what it is not. There is no location in the body where the pathological processes vary so rapidly and where a few hours may serve to clarify an hitherto obscure diagnosis. This is particularly true in diphtheria, and especially so in the severe type where early treatment is so essential. Rapid necrosis of the superficial tissues adjacent to the existing membrane, particularly if this is associated with edema, is almost pathognomonic of the action of the diphtheria toxin. Direct smears should not be neglected where the time element is so vital. In the

practice of pediatrics all sore throats should be cultured immediately. The blood serum should always be examined before being used and if it is dry it should be discarded. The tubes should always be kept in the erect position. To content oneself with taking a culture in the morning and resting contentedly under the delusion that one has fulfilled one's duty to his patient until a report is received on the following morning is either an evidence of insanity or unintentional malpractice, both of which are unfortunately only too frequently encountered. One must realize that negative culture reports may be received in cases of diphtheria. There is absolutely no excuse for delay in any doubtful case. Harm cannot come from unnecessary treatment; irremediable disaster may result from only a few hours of procrastination. Antitoxin is rendered available 10 times as rapidly by the intravenous route as by the subcutaneous route and four times as rapidly as by intramuscular injection.

In conclusion, for practical purposes, it may be stated that every death from diphtheria is preventable and avoidable. If this is true the enormous number of deaths each year must be attributed either to ignorance or negligence. Intensive education of the laymen and conscientious study on the part of the medical advisor will do much to combat this lamentable situation. Facts at times are disagreeable, but the facing of them and a grim determination to eradicate them will do much to mitigate the ravages of diphtheria.

R. N. ANDREWS, M.D.,

**ZUR FRAGE DER INTRAPERITONEALEN BLUTINFUSION:** Hans Opitz and Felix Metis (*Jahrbuch für Kinderheilkunde*, Berlin, 107, 269-290, Dec. 2, 1924). Opitz and Metis, using a small series of animals, have shown experimentally that citrated or defibrinated blood, when injected into the peritoneal cavity, is absorbed into the general circulation. They found that absorption began in some animals in a few hours and was completed in 16 to 96 hours. They believe that the red blood cells so injected are absorbed unchanged and therefore are in a functioning condition. At autopsy there was neither evidence of adhesions nor injury to peritoneum or abdominal viscera. A clinical investigation on thirteen infants further substantiated their animal experimentation, and they concluded that the intraperitoneal blood infusion is a practical substitute for the intravenous blood transfusion and causes fewer secondary reactions.

The beneficial results of intraperitoneal blood transfusion depend upon a rapid rate of absorption from the peritoneal cavity. The slow rate of absorption observed by Opitz and Metis, as noted above, is probably due to the fact that they used for transfusion, blood which had stood for  $\frac{1}{2}$  to 192 hours. In the experiments of Siperstein and Sansby (*Am. Jour. Diseases of Children*, Vol. 25, No. 2, February, 1923), it was shown that freshly prepared citrated blood injected immediately was completely absorbed from the peritoneal cavity within 5 hours,—absorption beginning within 15 minutes. Our observations, moreover, were based on a study of a larger series of animals and therefore were in many respects more conclusive.

J. MARTIN SANSBY, M.D.

**TRANSFUSION THROUGH THE UMBILICAL VEIN IN HEMORRHAGE OF THE NEW-BORN**—J. Buren Sidbury (*Amer. Jour. Dis. of Child.*, April, 1923): The use of human blood as a therapeutic agent in melena or hemorrhagic disease of the new-born has been one of the gratifying advances in medicine during the last decade. Human blood has acted as a specific in this condition. The etiology is not known. Hypoplasia of the coagulating elements of the blood may be a factor. From 2 to 6 per cent of these cases are syphilitic, according to Holt. Infection seems to act as a predisposing factor. From observation, we note that babies that have been more or less asphyxiated have a tendency to bleed. Trauma, such as is frequently suffered in difficult deliveries, and the common methods of resuscitation may well be exciting causes. Lucas and Dearing by the vital dye method demonstrated that the blood volume in infants was about one tenth of the body weight. If we use this as a basis, an infant has one ounce of blood to each pint in the adult. If we bear this relationship in mind, we may better appreciate what the loss of a few ounces of blood means to an infant. The author gives 100 c.c. of blood through the umbilical vein. The umbilical vein may be patent and accessible for transfusion up to, and including, the fourth day of life. The umbilical vein up to the fourth day is the most accessible vein in a new-born baby, if patent. The probability of a clot in the umbilical vein is very unlikely because the blood is fluid many hours after death in these cases. Transfusion through the sinus in cases of intracranial hemorrhage may increase intracranial pressure, which is not desirable. Transfusion through the superior longitudinal sinus is comparatively simple for one experienced, while the umbilical route is simple for those inexperienced in the sinus route. In the author's experience, the median basilic vein is always large enough to admit an 18 gauge needle in infants as young as 2 or 3 weeks, and is preferable to the superior longitudinal sinus usually; but it is necessary to dissect it out.

R. N. ANDREWS, M.D.

**THE CONSERVATION OF HEARING IN THE SUPPURATIVE MIDDLE EAR DISEASES OF CHILDHOOD:** Ralph Almoun, M.D., New York City, N. Y. (*Medical Journal and Record*, vol. 120, No. 12, Dec. 17, 1924). A properly made incision into the drum, in suppurative otitis media, will remain open as long as there is any pus in the middle ear. The resulting scar seldom causes any impairment of hearing. Multiple or repeated incisions into the drum are not desirable, injuring the drum permanently, and will not relieve a mastoiditis if already developed. The author believes that mastoiditis may heal spontaneously, not because of the drainage afforded through multiple openings in the drum, but through the natural ability of the patient to combat infection.

Suction is regarded as a valueless and dangerous method of treatment, and delays recovery.

Cases of mastoiditis which apparently subside spontaneously, but continue to have a prolonged aural discharge, generally should have a simple mastoid operation. Cases of chronic suppuration, attended by marked impairment of hearing, can generally be improved by a simple mastoid operation. The radical operation is rarely necessary in



children even where bone necrosis and danger of intracranial invasion is suspected.

Chronic suppuration of the tympanic mucosa usually occurs where a central defect exists in the drum, and presents an intermittent discharge, which recurs in the presence of infections of the upper respiratory passages. Such cases should have treatment directed toward the sources of infection in the nose and throat, as well as improving the general resistance of the body. Local treatment of the ear merely allays the individual attack.

THOS. MYERS, M.D.

**THE USE OF SULPHARSPHENAMINE IN THE TREATMENT OF CHOREA:** Rudolph D. Moffett, M.D. and Carl H. Smith, M.D. (*Archives of Pediatrics*, September, 1924). From earliest time chorea has been treated by the use of arsenic. The first use of arsenic, probably Fowler's solution, in the treatment of chorea is mentioned in 1826 by Gregory. Although it has been shown that chorea is rarely associated with syphilis, salvarsan has been employed in its treatment. In 1912, they treated a case of hemichorea with one injection of salvarsan, intravenously. There was an immediate cessation of the choreiform movements and a complete recovery of this patient.

The authors' method of treatment consists in placing the child in bed for 24 hours. The next day the child is given an intramuscular injection, usually into the buttocks, of 10 mg. of sulpharsphenamine for each kilo of body weight. The total quantity usually averages 0.2 to 0.3 gm., dissolved in 0.8 to 0.9 c.c. of distilled water. This dose is usually repeated at intervals of five days until three doses have been given. They have never observed any local inflammatory reaction at the site of injection, although in one child a scarlatiniform eruption followed. In two of their cases there was a rise in temperature to 102, which subsided in 24 hours. In all they have treated nine cases of chorea in children with this method. Of these, five showed definite clinical improvement.

In a disease as stubborn as chorea, where a beneficial effort is derived from medication, particularly when so readily administered, sulpharsphenamine is worthy of further consideration and study.

R. N. ANDREWS, M.D.

## GYNECOLOGY AND OBSTETRICS

### SUPERVISORS:

ARCHIBALD L. McDONALD,  
FIDELITY BLDG., DULUTH

L. W. BARRY,  
LOWRY BLDG., ST. PAUL

**THE HISTO-PATHOLOGY OF THE SYPHILITIC PLACENTA AND ITS CLINICAL SIGNIFICANCE:** C. Monkeberg and M. Aviles, Univ. of Chili, *Gynecology et Obstetrique*, May, 1924. This report is made from an extensive gross and microscopic study of 50 syphilitic pla-

centas with the membranes; a positive Bordet-Wassermann reaction having been obtained in 41 cases or 82 per cent of the series. Although their work largely confirms the well-known findings of others, they explain many of the clinical conditions which are observed in these cases.

The syphilitic placenta is of friable consistence and tears or breaks easily, which explains the frequency of retention of fragments; 50 per cent in their experience. Edema with a sero-sanguinolent fluid is almost constant and is explained by the vascular changes to be described. The weight of the placenta in relation to that of the fetus is always increased—from 14 or 16 per cent to 25 or even 50 per cent of the fetus. Infarction, generally involving the fetal surface, was found in 32 per cent of their series.

Microscopically these authors note almost constant decrease in the size of the maternal blood spaces. The villi are thickened, due to hypertrophy of the syncytial and Langhans cells. These changes are believed to be a causal factor in the production of premature labor. The vessels of the villi, arteries and veins, show a thickening principally involving the tunica interna in such a manner as to predispose to thrombosis, and obliteration. The media and adventitia are also thickened. In some instances they describe the development of varicosities to a degree resembling angiomatous structures. The vascular changes in the villi lead to poor circulation, anemia and necrosis of the tissues, involving at first the endothelial cells of the villi. This results in coagulation of the maternal blood and the complete shutting off of the areas involved. Such changes were found as microscopic lesions in 80 per cent of the series, but may also be found in other conditions.

In the maternal portion of the placenta they found extensive infiltration of leucocytes forming islands or strands of cells about the vessels, and replacing decidual cells.

The chorion is also infiltrated and shows true syphilitic inflammatory reaction. The amnion presents characteristic inflammatory changes, with hypertrophy of the endothelial cells, resulting in marked thickening. The authors have observed no constant relationship between the occurrence of such changes and the presence of excessive amounts of amniotic fluid. In the cord, they describe an edema present in cases of maceration of the fetus, and in some instances there was also a development of varicosities. However, they do not regard the latter findings as characteristic of syphilis. Microscopically, they noted a marked panarteritis and phlebitis, sometimes amounting to almost complete occlusion of the vessels. In 36 per cent of the series, a marked infiltration of Wharton's Jelly was found, which they designate as syphilitic funiculitis.

The syphilitic lesions of the placenta and cord explain the occurrence of abortion or premature labor in the absence of actual infection of the fetus. They discuss the rather academic question as to whether syphilis causes first the death of the fetus, and subsequently its expulsion from the uterus; or whether it results in the premature expulsion of a living fetus. Ordinarily and especially in cases of recent infection of the mother, the product of conception is killed, and is subsequently expelled; as is observed in other acute infectious processes. In instances where the syphilitic infection is more remote, the fetus is

expelled living, but is already handicapped, as a result of the circulatory disturbances.

Since search for the spirochetes in the fetus is not always successful, some authors deny such causal relationship. However, these workers emphasize the fact that the cause is only indirect. That is, the fetus perishes because of syphilitic changes in the placenta and vascular system. In some cases the characteristic lesions are rather more marked in the decidua and endometrium, and are sufficient to explain the death of the fetus or the abortion, since the trophoblast is unable to retain its usual relationship. Some of the cases of fetal death close to term may be explained by the changes in the umbilical cord.

The explanation for the frequent occurrence of hydramnios in cases of syphilis is not absolute, but the authors suggest: the possibility of excessive tension in the fetal and placental circulation due to enlargement of the fetal liver and compression of the umbilical veins. They also suggest the causal relationship of changes in the cord, or more directly a reaction from syphilitic inflammation of the amnion.

The increased maternal morbidity of the puerperium is explained by the syphilitic changes in the placenta and decidua, leading to retention, hemorrhage and sepsis.

Since the spirochetes are commonly found in the fetus, and infection is usually maternal or at least mixed, one should expect to find the organism in the placenta. However, in spite of many attempts by various workers, such positive findings are exceedingly rare, either because of technical difficulties, or of rapid destruction of the organisms. The authors were unable to demonstrate them in any of their cases.

A. L. McDONALD, M.D.

**DIFFUSE HYPERPLASIA OF THE DECIDUA AND HEMORRHAGE AT THE END OF GESTATION:** A. Riette (*Gynecologie et Obstetrique*, Vol. IX, No. 1). The term "Decidual Endometritis" includes a variety of abnormal conditions which require differentiation. The decidua basalis, because of the active relations of the maternal and fetal elements, occupies a special position. The decidua reflexa is rarely concerned, but the decidua vera is rather often involved in a variety of processes. In former times, following the teachings of Ruge, these were considered as inflammatory, and were described as being: glandular, interstitial, or mixed. Recently, as has been the case with conditions of the endometrium aside from pregnancy, it has been necessary to divide these conditions into the bacterial and non-bacterial. Among the non-bacterial forms we find a type characterized by changes in the decidua vera, "hyperplastic decidual endometritis." This may be found localized, forming polyps, more or less pedunculated and described first by Virchow. These are seen in ova of from three to four months expelled by abortion. The etiology is not definitely proven though syphilis has been commonly accepted as a frequent cause. There is also a diffuse form in which the thickened decidua is adherent to the fetal membranes over extensive areas, or where large portions of decidua are expelled during delivery at full term. The author presents a detailed report of a number of such cases with a study of the histological character of the tissue.

These concern instances where there was more or less extensive hemorrhage preceding or during labor, in at least one case suggesting placenta previa; and in which large portions of decidua were found adherent to the fetal membranes, or were expelled separately.

The author describes three histologic pictures as shown in the specimens examined: 1. The decidua shows a development corresponding to that of the third or fourth fetal month with but slight signs of degeneration. 2. In a second group the glandular hypertrophy has disappeared, and there is much degeneration in the superficial layers; there is still marked cellular hyperplasia; there is marked development of the blood vessels with hemorrhage into the tissues; and one finds evidence of persisting chorionic villi. 3. This represents a terminal stage, and one finds evidence of marked degeneration of the hypertrophied decidua which has not entirely disappeared. This persists most often near the lower pole of the ovum.

In explaining the causal factors, the author concludes that, in spite of the frequent finding of leucocytic infiltration, inflammation is not the cause. After discussing the histological picture, together with the clinical course, he concludes that the condition represents a delay in the normal physiological regression of the decidua and is due to constitutional factors, probably endocrin disturbances. He accepts the explanation of Vignes and Cornil that the condition is due to thyroid deficiency which causes a marked congestion of the endometrium and thus explains the hypertrophy of the decidua, and delay of normal retrogression. Clinically the condition may be associated with minute hemorrhages into the decidua or external hemorrhage. This explains the occasional cases which give a history of loss of blood during pregnancy, which in some instances resembles menstruation. Since the condition is most marked at the lower pole of the ovum where the delicate, enlarged vessels are easily disturbed, bleeding late in pregnancy or early in labor may occur to a degree suggesting placenta previa.

ARCHIBALD L. McDONALD, M.D.

**THE POST-CLIMACTERIC METRORRHAGIAS CAUSED BY TUMORS AND CYSTS OF THE OVARY. THE PHENOMENON OF REACTIVATION OF THE SENILE UTERUS OF OVARIAN ORIGIN:** P. Moulon-guet-Doleris (*Gynecologie et Obstetrique*, Vol. IX, No. 6). While accepting the classical teaching that post-climacteric bleeding is pathognomonic of cancer of the uterus, the author shows that this symptom may also be caused by solid or cystic tumors of the ovary. He has collected 52 such cases including 26 unpublished observations. This type of bleeding was observed in 20 per cent of 74 cases of ovarian neoplasm which developed after the menopause.

The type of bleeding is variable; sometimes a single profuse hemorrhage with or without pain; sometimes it is repeated with a certain degree of periodicity; but most often it is irregular in time and amount, extending over several weeks or months. There is often a profuse leucorrhea. On bimanual examination the ovarian tumor may not be discovered either on account of its small size, or because of thick abdominal walls. In other cases a mass in the broad ligament or a large abdominal tumor which is often accom-

panied by ascites, may suggest inoperable cancer unless the possibility of this type of metrorrhagia is kept in mind.

The symptom has been observed in association with all forms of ovarian tumor. The majority of the author's cases were due to benign tumors, so that the prognosis is usually good.

In 7 cases a minute study of the endometrium was made and demonstrated a marked hypertrophy of the mucosa in five specimens. The hyperplasia may be general or localized and small polyps are described. Either the glands or the stroma may be involved and the reaction resembles that of the premenstrual period. There seems to be a rejuvenation of the endometrium involving all of the constituents, and which is followed by the normal sequences: hemorrhage and leucorrhea.

The author discusses the pathogenesis with considerable reservation. Since the associated growth may be either unilateral or bilateral, and since the ovarian tissue may be more or less completely destroyed, he eliminates the influence of hormones. Because of the varying size of the tumors, mechanical pressure is not a factor. Since many of the growths were in the broad ligament, and because of the rather frequent association of torsion of the pedicle, he suggests that the bleeding is due to disturbances in the nervous plexus in the broad ligament, and trophic action upon the senile uterus.

In the diagnosis the demonstration of a palpable ovarian tumor should suggest the possible association. Several of the reported cases had been erroneously considered as uterine fibroids causing post-climacteric bleeding. It is generally agreed that simple uncomplicated fibroids do not become active after the menopause has been established.

The presence of ascites is likely to lead to the diagnosis of inoperable cancer, and is most unfortunate since many of the ovarian tumors which presented this symptom were benign and easily operable.

In the cases with small ovarian tumors which are not palpable, the condition is likely to be explained as cancer of the uterus.

A diagnostic uterine curettage may be necessary to exclude uterine cancer. Most of the cases were treated surgically with removal of the uterus and the tumor, though in some instances removal of the ovary will be sufficient. The use of radium is contra-indicated.

A. L. McDONALD, M.D.

**IS IT POSSIBLE FOR THE CORPUS LUTEUM TO BE A SOURCE OF PROFUSE INTRA-PERITONEAL HEMORRHAGE:** G. Schickele (*Gynecologie et Obstetrique*, Vol. IX, No. 1). Although the clinical and pathological picture of extra-uterine pregnancy is well recognized and generally accepted, there have been described numerous instances of severe intra-peritoneal hemorrhage, in which there was no demonstrable evidence of extra-uterine pregnancy. It has been assumed that such hemorrhage came from a ruptured follicle or corpus luteum cyst. It is probable that in many instances sufficient care has not been taken to exclude the presence of an ectopic pregnancy, since this may leave very slight evidence. Some authorities even deny the possibility of such a hemorrhage

in the absence of extra-uterine pregnancy. The author reviews in detail an extensive article by M. Forssner of Stockholm (*Acta Gynecologica Scandinavica*, Vol. 1), in which extremely rigid requirements are laid down in order to exclude a pregnancy. Forssner demands that serial sections of the anatomical specimen exclude the presence of any fetal tissue or decidua; also that a similar systematic examination be made of all of the blood clots in the peritoneum, since the product of conception may have been entirely expelled from the tube. Forssner also believes that some of the cases represent instances of ovarian pregnancy. The author is inclined to agree with Forssner that in many reports insufficient data are given to absolutely exclude extra-uterine pregnancy, but believes that his requirements are too rigid, since it would always be possible to claim that the product of conception had been extruded and overlooked. Neither can he agree that all of the others represent instances of early ovarian pregnancy. Schickele reports the detailed description of three instances in which pregnancy was excluded and presents positive evidence of, and an explanation for, changes in the corpus luteum which are sufficient to cause profuse intra-peritoneal bleeding. He demonstrates that there has been a degeneration in the granulosa layer in such a manner that the entire corpus luteum is forcibly separated from the theca interna and is expelled, leaving a number of the vessels torn and bleeding. The author therefore concludes that in a few instances positive proof may be furnished to explain such profuse intra-peritoneal hemorrhages from the corpus luteum in the absence of pregnancy.

ARCHIBALD L. McDONALD, M.D.

## ROENTGENOLOGY

### SUPERVISORS:

LEO G. RIGLER,

MPLS. GEN'L HOSPITAL, MINNEAPOLIS

A. U. DESJARDINS,

MAYO CLINIC, ROCHESTER

**APPARENT AND REAL DELAY OF EPIPHYSEAL DEVELOPMENT IN RICKETS:** Hans F. Plaut (*Fort. a. d. Geb. d. Roentgenstrahlen*, Vol. 32, p. 563, Dec., 1924). Roentgenologically visible epiphyses present before the onset of rickets are unaffected by mild types of the disease. In severe cases, the epiphyses are affected in various degrees so that the shadows appear much less dense and more hazy in outline. As improvement occurs, the intensity of the shadow increases from the center to the periphery, leaving a border of hazy contour, the thickness of which depends on the duration and severity of the disease. In very severe cases, epiphyses which were previously recognizable in the roentgenogram may disappear, to reappear when repair takes place.

Newly appearing epiphyses are unaffected in mild cases. In severe cases, during the acute stage, new epiphyses do not appear. This delay is only apparent, being due to the roentgen technique, the density of the epiphyses being no greater than the surrounding tissue, and therefore

not being visible in the roentgenogram. This is demonstrated by the sudden appearance of large well developed epiphyses in the roentgenogram within a few days after improvement has begun.

Only when the disease is so severe as to produce a general interference with body development, do the epiphyses actually fail to develop within the normal time. This occurs in about half of these cases. The true character of this delay is shown by the absence of epiphyses for some time after improvement has begun and their appearance as small nuclei when first seen.

LEO G. RIGLER, M.D.

**THE END RESULTS IN ROENTGEN RAY TREATMENT OF CUTANEOUS CANCER:** Hazen and Whitmore (*Am. Jour. Roent.*, vol. xiii, p. 144, Feb., 1925). In 160 patients afflicted with 244 basal cell carcinomas, 84 per cent of the patients and 88 per cent of the tumors were cured by roentgen irradiation. Ninety-three per cent of selected cases and 96 per cent of selected tumors were cured.

Deep ulcers or nodules, growths on the ear and in cartilage, older growths and larger growths all are more difficult to treat. Cures were obtained in 50 per cent of previously treated cases.

The results from roentgen rays are approximately the same as those obtained from radium or excision.

Apparently an increase in dosage from  $1\frac{1}{2}$  units to  $2\frac{1}{2}$  units did not produce a greater percentage of cures. The authors used unfiltered rays in all superficial lesions.

The cosmetic results were good; there were very few dele-

terious effects, chiefly telangiectases; 94 per cent of all recurrences came in the first year.

A small number of prickle cell carcinomata showed 45 per cent cures. A few cases of carcinomatous glands showed 41 per cent cures.

The authors present a review of the theories explaining the mode of action of radiation upon carcinoma. Some of their observations lead them to believe with Murphy and others that the effect is upon the healthy tissues, not upon the cancer cells themselves.

LEO G. RIGLER, M.D.

**TWO CASES OF TYPICAL OSTEOCHONDROPATHY OF THE MEDIAL SESAMOID BONE OF THE FIRST METATARSAL:** Alex Renander (*Acta Radiologica*, vol. iii, p. 521, Dec., 1924). Two cases of pain in the feet are presented. In both there was no history of injury and weight bearing caused the pain to appear.

Roentgen examination revealed a hitherto undescribed condition affecting the medial sesamoid of the first metatarsal. The bone was flattened, showed evidence of pressure deformity from the head of the metatarsal, and was fragmented. The outlines of the bone were hazy and areas of increased density were present.

One of these was extirpated and the microscopic picture was very similar to that of osteochondritis juvenilis deformans. The roentgen appearance is also so similar that the author classifies this condition with that group of osteochondropathies which include Legg-Perthe's, Schlatter's, and Kohler's disease.

Both patients recovered fully, one following rest, the other extirpation of the affected sesamoid.

LEO G. RIGLER, M.D.

## MINNESOTA STATE BOARD OF MEDICAL EXAMINERS JANUARY (1925) LICENTIATES

### BY EXAMINATION

<i>Name</i>	<i>School and Date of Graduation</i>	<i>Address</i>
Alexander, Clifford Eugene...	U. of Minn., M. B., 1924.....	3244 5th Ave. So., Minneapolis.
Arestad, Fritjof H.....	U. of Minn., M. B., 1924.....	Sacred Heart, Minn.
Bardon, Richard .....	N. W., 4 yr. cert. Med., 1924....	St. Mary's Hospital, Minneapolis.
Berg, Henning Milton.....	U. of Minn., M. B., 1924.....	General Hospital, Minneapolis.
Berkwitz, Nathan Joseph.....	U. of Minn., M. B., 1924.....	University Hospital, Minneapolis.
Bittner, Joseph Eric.....	N. W., 4 yr. cert. Med., 1924....	St. Mary's Hospital, Minneapolis.
Blackford, Launcelot Minor...	U. of Va., M. D., 1923.....	Rochester, Minn.
Boe, Aslak Milo.....	U. of Minn., M. B., 1924.....	329 Union St. S. E., Minneapolis.
Bomberger, Charles Benjamin.	U. of Minn., M. B., 1924.....	Mapleton, Minn.
Dunne, Gerald Peter.....	McGill, M. D., 1924.....	Holloway, Minn.
Dunlap, Earl Hammond.....	U. of Minn., M. D., 1924.....	3462 Minnehaha Ave., Minneapolis.
Edstrom, Henry .....	U. of Minn., M. B., 1924.....	Two Harbors, Minn.
Ellingson, Abel Rudolph.....	U. of Minn., M. B., 1924.....	General Hospital, Minneapolis.
Emerson, Edward Charles.....	U. of Minn., M. B., 1924.....	835 Geranium, St. Paul.
Eriksen, Lester Gabriel.....	U. of Minn., M. B., 1924.....	University Hospital, Minneapolis.
Fisch, Herbert Matthew.....	Georgetown U., M. D., 1924....	St. Mary's Hospital, Minneapolis.
Francis, David W.....	U. of Minn., M. B., 1924.....	Ancker Hospital, St. Paul.



<i>Name</i>	<i>School and Date of Graduation</i>	<i>Address</i>
Fried, Louis Alexander.....	U. of Minn., M. B., 1924.....	University Hospital, Minneapolis.
Gaalaas, Alban Felix.....	U. of Minn., M. B., 1924.....	3500 Park Ave., Minneapolis.
Giesen, Allan Francis.....	U. of Minn., M. B., 1924.....	4251 Vincent Ave. S., Minneapolis.
Grose, Frederick Nicolay.....	U. of Minn., M. B., 1924.....	General Hospital, Minneapolis.
Gullikson, John Wendell.....	U. of Minn., M. B., 1924.....	N. P. Hospital, Tacoma, Wash.
Hand, John Redmond.....	U. of Minn., M. D., 1924.....	Rochester, Minn.
Hansen, Arild Edsten.....	U. of Minn., M. B., 1924.....	3957 12th Ave. So., Minneapolis.
Hilbert, Eunice Helen.....	U. of Minn., M. B., 1924.....	General Hospital, Minneapolis.
Heidner, Frederick Carl.....	Rush, 4 yr. cert. Med., 1924.....	Ancker Hospital, St. Paul.
Hilton, James Marion.....	U. of Minn., M. B., 1924.....	Ancker Hospital, St. Paul.
Johnson, Carl Edwin.....	U. of Minn., M. B., 1924.....	831 Thomas, St. Paul.
King, George Lynn.....	U. of Minn., M. B., 1924.....	2627 Chicago Ave., Minneapolis.
Kohl, Harold Willis.....	U. of Minn., M. B., 1924.....	2112 25th Ave. N., Minneapolis.
Mueller, Gustav Gottlieb.....	U. of Minn., M. B., 1924.....	Ancker Hospital, St. Paul.
Neubeiser, Ben Lawrence.....	U. of Minn., M. B., 1924.....	St. Mary's Hospital, Duluth.
Orlob, William .....	Frankfurt Univ., Prussia, Ger., Dr. of Med., 1920.....	Renville, Minn.
Potter, Edith Louise.....	U. of Minn., M. B., 1924.....	3305 Oakland Ave., Minneapolis.
Quale, Victor Sigvald.....	U. of Minn., M. B., 1924.....	University Hospital, Minneapolis.
Rucker, Charles Wilbur.....	U. of Minn., M. B., 1924.....	1525 16th Ave. N., Seattle, Wash.
Schild, Emmett L.....	U. of Minn., M. B., 1924.....	N. P. Hospital, St. Paul.
Stoesser, Albert Valentine....	U. of Minn., M. B., 1924.....	495 Aurora, St. Paul.
Stuurmans, Sheldon Harry....	U. of Minn., M. B., 1924.....	General Hospital, Minneapolis.
Swenson, Arnold Oliver.....	U. of Minn., M. D., 1924.....	Marine-on-St. Croix, Minn.
Ude, Walther Herman.....	U. of Minn., M. B., 1924.....	General Hospital, Minneapolis.
Vaaler, Torvald .....	U. of Minn., M. B., 1924.....	Swedish Hospital, Minneapolis.
Whelan, Anna .....	U. of Pa., M. D., 1921.....	517 Essex St. S. E., Minneapolis.
Wickham, Mont Cecil.....	U. of Minn., M. B., 1924.....	5009 Tireman Ave., Detroit, Mich.
Wohlrabe, Clarence Frederick.	U. of Minn., M. B., 1924.....	Swedish Hospital, Minneapolis.
Wohlrabe, Edwin John.....	U. of Minn., M. B., 1924.....	General Hospital, Philadelphia, Pa.
Zachman, Albert Herbert.....	St. Louis U., M. D., 1924.....	St. Mary's Hospital, Minneapolis.

## THROUGH RECIPROCITY

Blanton, Smiley .....	Cornell, M. D., 1914.....	Lymanhurst Hospital, Minneapolis.
Burman, Guy Elmer.....	U. of Neb., M. D., 1918.....	Rochester, Minn.
Busby, James Leslie.....	Starling-Ohio, M. D., 1913.....	Rochester, Minn.
Combacker, Leon Clinton....	U. of Mich., M. D., 1909.....	225 7th Ave. S. E., Minneapolis.
Graves, Waldo Neil.....	Rush, M. D., 1924.....	1645 Hennepin Ave., Minneapolis.
Hall, Henry Homer.....	Hamline, M. D., 1908.....	Webster, Wis.
Kenefick, Emmett Vincent....	U. of Ia., M. D., 1923.....	Church Club, St. Paul.
McKnight, Roy Bowman.....	U. of Pa., M. D., 1920.....	Rochester, Minn.
McManus, Clara .....	Sioux City Col. Med., M. D., 1902.	446 McKnight Bldg., Minneapolis.
Morton, Charles Bruce.....	U. of Va., M. D., 1922.....	Rochester, Minn.
Schulz, Irwin Wm. Paul.....	Marquette, M. D., 1924.....	Rochester, Minn.
Scott, Robert Andrew.....	Queens, M. D., 1907.....	Crystal, N. D.
Shippey, Stuart Hunter.....	Emory U., M. D., 1923.....	Rochester, Minn.
Wiese, Henning Frithjof .....	U. of Kristiania, Norway,	
Blomberg .....	Dr. of Med., 1915.....	Eau Claire, Wis.

## NATIONAL BOARD CREDENTIALS

Fink, Walter Henry.....	U. of Minn., M. D., 1921.....	301 Phys. and Surg. Bldg., Minneapolis.
-------------------------	-------------------------------	---

## BOOK REVIEWS

### BOOKS RECEIVED FOR REVIEW

- PEDIATRICS.** The Practical Medical Series. Vol. IV. Edited by Isaac A. Abt, M.D. 381 pages. Illustrated. Cloth, \$2.00. Chicago: The Year Book Publishers, 1925.
- DISEASES OF THE RECTUM AND PELVIC COLON.** Martin L. Bodkin, M.D., F.A.C.S., New York. Illustrated. 2nd edition, revised, and enlarged. 487 pages. Cloth, \$6.00. New York: E. B. Treat & Co., 1925.
- THE TECHNIC OF LOCAL ANESTHESIA.** Arthur E. Hertzler, A.M., M.D., Ph.D., LL.D., F.A.C.S., Kansas City, Kansas. 3rd edition. 272 pages. 140 illustrations. Cloth, \$5.50. St. Louis: C. V. Mosby Company, 1925.
- ANNUAL REPRINT OF THE REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR 1924.** Cloth. Price, postpaid, \$1.00. 82 pages. Chicago: American Medical Association, 1925.

This volume contains the reports of the Council on Pharmacy and Chemistry that have been adopted and authorized for publication during 1924. Some of these reports have appeared in The Journal of the American Medical Association. Others are now published for the first time.

The annual volumes of the "Council Reports" may be looked on as the companion volumes to New and Non-official Remedies. While the latter contains the medicinal preparations that are found acceptable, the reports contain the reasons why certain products were not accepted. Thus the present volume contains reports on the following products which the Council denied admission to New and Non-official Remedies: Aolan; Aspatol; Atussin, Peptoproteasi, Paraganglina Vassale, Fosfoplasmina, Asmoganglina and Endo-Ovarina Tablets; Borosodine; Carsinol; Colodine and Colobromidine; Ferrasin; Glyeuthymenol; Hoyt's Gluten

Flakes; Iodeol; Loefflund's Food Maltose; Mistura Creosote Comp. (Killgore's) and Tablets Cascara Comp. (Killgore's); Neo-Riodine; Nicomors; Peptone Solution for Hypodermatic Use (Armour); Pibalbol; "P-O-4"; Pollanting; Promonta; Pruritus Vaccine Treatment-Lederle (Montague Method); Restor-Vin; Some "Mixed" Vaccines of G. H. Sherman and Tersul Hiller.

The volume also contains reports on products which were included in former editions of New and Non-official Remedies but which will not appear in the 1925 edition because they were found ineligible for further recognition. Among these are polyvalent antipneumococcic serum, colon bacillus vaccine, gonococcus serum and gonococcus vaccine.

The volume contains a number of reports of a general nature: for instance a report on the therapeutic value of benzyl benzoate; a report on anaphylaxis produced by thromboplastic substances and a report on the therapeutic use of digitalis.

Physicians who keep fully informed in regard to the value of proprietary remedies will wish to own this book.

**BLOOD CHEMISTRY, COLORIMETRIC METHODS, FOR THE GENERAL PRACTITIONER.** By Willard J. Stone, M.D., Pasadena, Cal., Attending Physician, Los Angeles Gen. Hospital. First Edition 71 pages. New York: Paul B. Hoeber, Inc. \$2.25.

The colorimetric methods described in this book for the important constituents of the blood are some of the best available at the present time. It is to be regretted, however, that the author has not mentioned the aeration method for the determination of urea. The general practitioner is not a trained technician and very often the urea determination by the described method fails.

This book has nothing original and is not in any respect an improvement over some of the larger treatises on the subject.

WM. W. SWANSON, M.D.

**A PRACTICAL COURSE IN STANDARDIZED PHYSIO-THERAPY,** under auspices of Biophysical Research Department of Victor X-Ray Corporation, is now available to physicians. Offers a highly practical knowledge of all the fundamental principles that go to make up the standards of modern scientific physiotherapeutic work. Course requires one week's time. For further information apply to J. F. Wainwright, Registrar, 236 South Robey Street, Chicago, Ill.

**OFFICE SPACE FOR RENT** together with group of physicians with common waiting room and x-ray and clinical laboratory. New building constructed for physician's offices. Located in the hospital center. Six minutes' walk from the center of town. Two rooms with waiting room—\$50.00 to \$65.00. If specializing please state in what branch. Free automobile parking for doctor and patients. Address C-17, care MINNESOTA MEDICINE.

**WANTED—Salaried appointments for Class A physicians** in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

**FOR SALE OR RENT—Rest Hospital** located at 2527 Second Avenue South, Minneapolis. Operated by present owner for twenty years. Twenty-five beds. Well equipped. Ideal location for nervous and convalescent patients. Beautiful grounds.

**WANTED—Position as office assistant or in dispensary work** in St. Paul or Minneapolis by graduate nurse. Good references. Address C-15, care MINNESOTA MEDICINE.

**GOOD OPENING—Splendid location for doctor in good dairying community.** For full particulars address Secretary of Commercial Club, Plummer, Minnesota.

**IF YOU ARE GOING on the Tri-State Clinic Tour** and want a doctor for locum tenens, address C-16, care MINNESOTA MEDICINE, for physician available in May.

**ST. PAUL OFFICE TO SUBLET—At 230-232 Lowry Bldg.,** by Dr. W. D. Kelly. Prefer aurist, rhinologist, laryngologist, orthopedist, pediatricist, neurologist, obstetrician or exodontist. Telephone Cedar 1600.

**WANTED—Position as stenographer or assistant in doctor's office in Minneapolis or St. Paul.** Five years' stenographic experience. Good references. Address C-8, care MINNESOTA MEDICINE.